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IODINE: ITS MOST IMPORTANT AND LATEST USES.

J. L. WOLLHEIM, M.D.,

Assistant Visiting Physician, New York City, Home for Aged and Infirm, Assistant Urologist, German Hospital Dispensary.

NEW YORK CITY.

While looking over the literature of iodine in genito-urinary diseases, I was impressed by the multiplicity of uses of this drug in medicine and surgery. The literature is so voluminous (large papers having been written on its use in single conditions), that it would be futile to attempt to describe all of them in detail. I feel, however, that it will be of a great advantage to have its most important and latest uses in a single paper, so that they may be referred to with despatch.

In the following pages I shall dwell only upon the uses of iodine and not the iodides.

Iodine was discovered by Curtois in 1812. Its antiseptic properties were discovered by Davaine in 1873[1], though Senn and Sajous speak of Liebig's early work.

The preparations most commonly used and their strengths are:

Tincture	7%
Ointment	4%
Liq. Iod. Comp. (Lugol's Sol.—non-alcoholic)	5%
Battey's Fluid[2] (iodine 2 pts., phenol 1 pt.)	66%
Morton's Fluid[2] (iodine 1 pt., potass. iodide 3 pts., glycerine 48 pts.) about	1%
Churchill's Tincture[3] (iodine 5 pts., potass. iodide 1 pt., water 8 pts., and alcohol 32 pts.)	about 11%

Special formulae will be given under special uses.

USES IN GENERAL SURGERY.

1. *Preparation of the Skin Prior to Operation.* While this method is attributed to A. Grossich[4] the author has found in the literature two instances in America where tincture of iodine as a skin disinfectant before operation, (Cannaday[5], W. Va. 1906, and Dannreuther[6], N. Y. 1908) was spoken of. While Grossich, and later Guibe[7] deserve credit for a systematic study of this method in a large number of cases, its priority may be open to discussion.

Method: Shave the skin dry and paint with tincture of iodine before operating. Do not use water or other solution immediately before using iodine. Over 220 cases, no infection.

Waterhouse[8] recently recommended painting the entire scrotum and penis with 2% iodine in spirits at any operation where he thought it likely that they would be uncovered, as in hernia, and any laparotomy in children.

2. *Disinfection of the Surgeon's Hands.* Senn[9] quotes Roux as the first to make use of tincture of iodine in hand disinfection. Roux dips his fingers in the tincture to disinfect the nails and adjacent parts where folds are otherwise reached with difficulty. Mikulicz and Senn adopted Roux's method. I used this method for some time but did not know who recommended its use until recently. It is excellent where gloves are not used, and here Senn praises it highly.

Heusner[10] uses the following formula: tincture iodine, 10 pts., benzine 750 pts. and paraffin 250 pts. He coats his hands with this and operates without further preparation. This method does not seem to be popular in this country; perhaps we may be thankful.

3. *Obliterating Varicose Veins.* Schiassi[9] reports sixty cases in which he exposed the internal saphenous vein above the internal condyle and injected into its distal end 30 to 50 c.c. of the following solution: iodine, 1 pt., potass. iodide 1.6 pts. and water 10 pts. In a week the veins were transformed into cords. He has seen no toxic symptoms and nothing but good results. He claims he sets up an endophlebitis. His method deserves an extended trial.

4. *Postoperative in Joints.* Tatchell[11] claims good results from swabbing out joints after operation. Heuses, the iodine liniment of the British Pharmacopeia, consisting of iodine 5 pts., potass. iodide 2 pts., glycerine 1 pt., alcohol 40 pts.

5. *Tuberculous Lesions.* Finocchiaro[12] in 1908 reported 12 cases of tuberculous epididymo-orchitis in which he injected a 1% aqueous iodine solution and claimed good results in all. He reports 3 cases in detail. He claims it transforms the lesion into a fibrous mass. He uses about 30 injections. This method, in my opinion, should be limited to those patients with no renal or pulmonary infection, who

refuse operative interference for their scrotal lesions.

Belfield[13] in 1892 injected a 5% aqueous solution of iodine trichloride in tuberculous epididymitis. He also used it in vesical tuberculosis as a topical application. This, in my opinion, should be reserved for inoperable cases.

Durante[14] in 1894 used hypodermatic injections of iodine in tuberculous adenitis, arthritis and other tuberculous processes, and claimed good results. He used 1 c.c. of his 1% solution hypodermatically daily and increased the strength to 5%, extending the treatment over six months. His formula was: iodine, 1 to 5 pts.; potass. iodide, 10 pts.; water, 100 pts.

Giannassa[15] used Durante's method and studied the effects on tuberculous adenitis of children. He gave 30 injections in each case and found lymphocytosis with a good result in the lesions. This method seems to have been successful in the hands of Giannassa and should be thought of when surgical interference is contraindicated or refused. Fresh air and good food should be insisted upon as an adjuvant when this treatment be adopted.

Leonardo[16] says iodine injected into region of tuberculous lesions produces an irritation and hence a local leucocytosis, which is bactericidal.

6. *Sinuses.* Willard[17] recommended iodine injections into sinuses to aid their closure. I can confirm the good effects, but I believe the bismuth injections supersede this method.

7. *Boils.* Claret[18] paints once daily with iodine 4 pts., acetone 10 pts. I believe other methods are more effective, e. g., pure phenol on wooden pick followed by salicylic acid ointment.

8. *Healing of Aseptic Wounds.* Schantz[19] recently claimed that when a healing wound has a slight irritation it heals with the least width of scar. He paints a healing wound on the 3rd and on the 5th day, with tincture of iodine. Large wounds he paints once daily, and claims almost threadlike scars.

Theoretically, close coaptation should make a good scar, providing no infection ensues. Schantz believes the coat of iodine draws the already approximated surfaces still closer together. Waterhouse[8] recently recommended painting all wounds such as those of colostomy, cecostomy, etc., that were liable to be infected, with iodine solution, 2% in alcohol. I never use iodine on an aseptic wound but I believe that Waterhouse's method is good.

9. *Miscellaneous.* These uses are so numerous that credit cannot be given to the authors thereof, neither do I believe it possible to mention the majority of them.

Gunshot Wounds. Swab the tract with tincture of iodine after the removal of the wad or bullet and pack with gauze wet with tincture of iodine. One can feel reasonably sure of preventing tetanus infection if this is done early. If the case is seen late, lay the tract wide open, swab liberally with tincture of iodine, and pack with iodine gauze, but also give antitetanic serum. I recently saw a case of tetanus due to a bullet, shot through the foot, ten days previously. The tract was laid open, treated as above indicated and with the administration of antitetanic serum, and the patient recovered. I saw this method of treating bullet and blank cartridge wounds used frequently in one of the largest surgical clinics in New York, and no case of tetanus ever developed under our care. We also used antitetanic serum as a prophylactic during the last two years, and we at all times made sure of removing the so-called wads from the blank cartridge cases.

Dog and Other Animal Bites and Scratches. Here we have a good field for the tincture and it should be used freely.

Irrigating Wounds. Popoff[20] uses 1-10,000 iodine.

Septic Wounds. Use tincture of iodine, iodine gauze and any wet dressing but phenol or bichloride of mercury. I have not been very successful in treating these cases with hyperemia.

Fresh Lacerated Wounds. I paint the torn surfaces freely with tincture of iodine, after bathing with hydrogen peroxide, and then suture. The results are good.

Bursitis, Synovitis and Sprains. Tincture of iodine and pressure bandage.

Tenosynovitis. Tincture of iodine along tendons and immobilization.

Sloughing Tumors and Stumps. Paint well with iodine before operation.

Subdermal Administration of Medicine. Before piercing the skin with the needle, paint the skin with tincture of iodine as recommended by Cannaday[5].

Ulcers. Roop[21] recommends painting ulcers with tincture of iodine on and around lesions if granulations are unhealthy and foul. The zinc-oxide-gelatin dressing of Unna is an excellent adjuvant.

Venereal Sores. Here I believe we have one drug that is excellent. After using iodide, I dust with one of the iodide powders, as thymol iodide.

Bubonic Abscess Cavities. These cavities clean up earlier if swabbed well with tincture of iodine.

Spina Bifida. Injections of Morton's fluid, formerly much used, is often indicated in inoperable cases.

Hydrocele. Injection of tincture of iodine after aspirations, is useful but more painful than the injection of phenol. The open method is best because the sacs may be multiple as in a case where I found four distinct sacs.

Infected Ingrown Toe-nail. Pack with tincture of iodine gauze, after treating with tincture of iodine locally.

Preparation of Catgut. Claudius introduced this method. The raw gut is soaked in a solution of iodine, one part, potass. iodide one part, water one hundred parts, for eight days, and then transferred to phenol solution. This gut is used very extensively. Its drawback seems to be its lack of tensile strength and its inadaptability for certain work. Moschcowitz has modified Claudius method, preserving the gut dry after the iodine bath. McDonald[22] very recently mentioned an iodine-acetone method of sterilizing and preparing catgut so as to obviate some of the shortcomings of Claudius' gut.

USES IN GYNECOLOGY.

Puerperal Sepsis. Here Cabanas[23] paints the cervix and uterine mucosa with a 4% aqueous solution or the tincture twice daily.

Plastic Parametritis. Here Cabanas uses the same method as above and reports 35 cases of this condition and puerperal sepsis with good results.

Cannaday irrigates the uterus with 1 to 1000 solution. Pryor, and later Burtenshaw, used iodoform for its iodine content as a packing into the uterus and cul de sac, without brilliant results. I do not know whether iodine gauze has ever been used after the original Pryor method, but it appears to me that it may be better.

Chronic Endometritis. After curettage paint endometrium with Battey's fluid.

Ulcers and Erosions of Cervix and Endocervicitis. Paint with tincture of iodine or Churchill's tincture.

Gonorrheal Endometritis and Endocervicitis. Iodine has been highly lauded of late in the treatment of these conditions. After a fairly large experience in treating gonorrheal conditions, I would be reluctant to abandon the use of the silver salts as a routine treatment. Exceptional cases may provide indications for the use of iodine.

Ovarian Cysts. Alison in 1846 used an injection of tincture of iodine into the sac. This is not alone bad surgery, but positively dangerous, for Wood[24] reports from the literature a death after the use of this method.

Miscellaneous Gynecological Uses. Always paint the cervix with tincture of iodine before introducing any instrument into the uterus. Smears from the cervix usually show staphylococci, streptococci and bacilli, if not gonococci.

In Obstetrical Work, if not using gloves, use the method of Roux: dip the finger tips into tincture of iodine.

In Non-Gonorrheal Vaginitis a douche composed of one drachm tincture iodine to one quart water (iodine 1-3500) once or twice daily, is excellent.

USES IN THE MOUTH, NOSE AND THROAT.

Pyorrhea Alveolaris. Butler[25] recommends it here. Of course, scraping and other treatment is also necessary for good results in this most obstinate disease.

Atrophic Naso-pharyngitis. McKenzie[26] recommends tincture of iodine after cocainization.

Acute Tonsillitis. Floersheim[27] recommends the tincture to the tonsils to either abort an acute case or reduce its severity. I have seen some good results in this condition.

Chronic Hypertrophy of Tonsils. Slow and not satisfactory.

Dental Caries. Tincture of iodine with aconite as a local application often gives relief from pain.

Other uses in the mouth and throat are along the line of general surgical principles.

USES IN DERMATOLOGY.

The use of iodine has been rather extensive in this field. In this connection see the paper in the *American Journal of Dermatology* for December, 1905, by Kinnaman.

Blastomycosis and Actinomycosis. The late Nicholas Senn[9] used iodine by cataphoresis in a case of blastomycosis and also in one case of actinomycosis with excellent results.

USES IN OTHALMOLOGY AND OTOLOGY.

I have not had any experience with iodine in these fields, but it is recommended in corneal ulcer and trachoma.

USES IN MEDICINE.

Typhoid. Campanelli[28] recently injected one centigramme of iodine daily in Durante's formula (vide supra) with Durante's method and after six days his cases entered into convalescence. It may act here to increase leucocytosis as in the joint and gland cases spoken of above.

Dysentery. Sajous recommends Lugol's solution, one drachm to one pint of water as a rectal injection, night and morning.

TOXICOLOGY.

I have found in the literature comparatively few

cases of toxic effects from iodine and I agree with previous authors that these effects are rare. A few cases are here given:

W. O. Culpeper[29], 1888, reports death of a child eleven years old from two drachms of tincture of iodine. He also speaks of a case which recovered after two and one-half drachms taken internally.

Wood reports a death after injection of tincture of iodine into an ovarian cyst.

Witzel[30] reports sloughing of buccal mucous membrane. This lesion is seen in varying degrees of severity in acute iodism.

Hanasiewicz[31] recently reported a case of gangrene of the skin of the scrotum after painting with tincture of iodine. This case is very interesting because of the recommendation very recently made by Waterhouse (vide supra).

CONCLUSIONS.

In iodine, we possess a very potent drug. Its antiseptic power has been conclusively proven by Kinnaman, from whose original paper I quote:

1. From 0.2% to 1.0% iodine is an antiseptic of marked potency.

2. It is far superior to bichloride of mercury. Two per cent. solution killed steptococcus pyogenes in two minutes.

3. (a) It is easily prepared and is stable.
   (b) It is one-fourth as toxic as bichloride of mercury.
   (c) It does not coagulate albumen.
   (d) It is effective in very brief time.
   (e) The stain soon disappears (easily removed by aqua ammonii).
   (f) It is very penetrating.

4. One-half of one per cent. is strong enough for all purposes as an antiseptic.

Nicholas Senn was a strong advocate of iodine in surgery. In his valuable article his conclusions are:

1. Iodine is the safest and most potent of all known antiseptics.

2. Iodine in proper dilution to serve its purposes as an antiseptic does not damage the tissues; on the contrary, it acts the part of a useful tissue stimulant, producing an active phagocytosis—a process so desirable in the treatment of acute and chronic inflammatory affections.

3. In the treatment of simple hyperplastic goiter, actinomycosis and blastomycosis the local use of iodine is made more effective by cataphoresis.

With Cannaday, Dannreuther and others I believe this drug should be used much more frequently than it is. I believe it is particularly valuable in sloughing wounds, with their multiple bacterial contents; in wounds liable to carry tetanus bacilli, pistol-shot and blank cartridge, and all so-called "Fourth of July" injuries.

It is beyond doubt the best remedy to disinfect the skin beneath and around the nail before operation as suggested by Roux. Its use as a skin germicide and disinfectant before operation is bound to grow into universal favor.

338 East 79th street.

REFERENCES.

1. KINNAMAN: *Journal A. M. A.*, August 26, 1905, p. 602.
2. WILCOX: *Materia Medica*, 4th American Edition.
3. NATIONAL FORMULARY.
4. GROSSICH: *Berliner Klinische Wochenschrift*, October 25, 1909.
5. CANNADAY: *Journal A. M. A.*, April 14, 1906.
6. DANNREUTHER: *Med. Record*, January 25, 1908.
7. GUIBE: *Journal A. M. A.*, 1909, Vol. II, p. 83.
8. WATERHOUSE: *Lancet*, April 16, 1910.
9. SENN: *Surgery, Gynecology and Obstetrics*, July, 1905.
10. HEUSNER: *Abstract Journal A. M. A.*, August 31, 1907.
11. TATCHELL: *British Med. Journal*, February 13, 1909.
12. FINOCCHIARO: *Polyclinico Romano*, February, 1908.
13. BELFIELD: *Journal Cutaneous & G. U.*, August, 1892.
14. DURANTE: *Medical Weekly*, 1894, Vol. II, p. 277.
15. GIANNASSA: Abstracted in *N. Y. Med. Journal*, July 15, 1905.
16. LEONARDO: Abstracted in *Journal A. M. A.*, 1909, p. 424.
17. WILLARD: *Annals of Surgery*, December, 1896.
18. CLARET: *Review Med. Pharmaco*, April 15, 1904.
19. SCHANTZ: *Centralblatt Fuer Chir.*, August 8, 1908.
20. POPOFF: *British Med. Journal*, August 1, 1891.
21. ROOP: *Journal A. M. A.*, May 3, 1908, p. 1790.
22. MCDONALD: *American Journal of Surgery*, May, 1910.
23. CABANAS: Abstract, *N. Y. Med. Jour.*, June 22, 1907.
24. WOOD'S THERAPEUTICS, 10th Edition.
25. BUTLER'S MATERIA MEDICA, 5th Edition.
26. MCKENZIE: *British Med. Jour.*, April, 1895.
27. FLOERSHEIM: *N. Y. Med. Jour.*, October 5, 1901.
28. CAMPANELLI: Abstracted in *Journal A. M. A.*, May 6, 1905.
29. CULPEPER: *Therapeutic Gazette*, 1888, Vol. IV.
30. WITZEL: *Deutsche Med. Woch.*, Vol. 46, XXXI.
31. HANASIEWICZ: *Muenchener Med. Woch.*, Vol. LIV, No. 51.

VOLKMAN'S ISCHEMIC PARALYSIS.

The first symptom that attracts attention is swelling of the hand and fingers from passive congestion. Pain is rarely complained of. The absence of this symptom may cause delay in the changing of the dressing. When the splints are removed it will be found that at certain points there will be pressure sores. In fact, these may be so bad that sloughing will occur. The flexor muscles are tender on pressure, and indurated masses can be felt in them. The fingers at first are semi-flexed, but very soon the characteristic deformity becomes developed.—W. O. ROBERTS in *The Louisville Monthly Journal.*

TREATMENT OF LATERAL CURVATURE OF THE SPINE.

CARL R. KEPPLER, M. D.,
Consulting Orthopedic Surgeon, Fordham Hospital; Chief of Orthopedic Division, Fordham Hospital, O. P. D.; Orthopedic Surgeon to Harlem Hospital, O. P. D.; Clinical Professor of Orthopedic Surgery, Fordham Medical College, etc.
NEW YORK CITY.

I wish to preface the more detailed description of treatment with a short summary of what we have to deal with. The flexible spinal column is so formed by nature as to allow extreme latitude of body motion in nearly every direction. Moreover, it bears in whole or in part, continuous strain from the superincumbent weight and general muscular activity. It is therefore natural that weakness or injury, however trivial, will more easily affect this structure than any other portion of the skeleton. Thus through some possible congenital defect in it—as shown in late years by Dr. Boehm of Berlin—or later through injury, disease or overstrain, its function becomes distorted, with consequent disarrangement of its internal relationship, deformity of its component parts through the unequal, continuous strain they are exposed to, and more or less marked slowly increasing deviation of the entire structure. This affects, on account of their close connection, the trunk itself, relatively to the amount of spinal curvature and twisting; disarranging the position and shape of the organs therein contained.

The apparent deformity is at first only a bending of the spine and body to one or the other side. As forces productive of this condition continue to exert their harmful influence this increases and, on account of the peculiar shape of the articular facets of the individual vertebrae, a turning—rotation—of one upon the other, occurs. Persistence and increase of deformity are actively resisted by the muscles and soft tissues of the spine and the irregular distribution of the weight upon the individual vertebrae causes in time—as shown by Dr. Wolff and named his law—a consequent disarrangement of their internal structure. It becomes more dense at the point of greatest, continuous pressure, the vertebra itself misshapen. These conditions—continued muscular strain, uninterrupted ligamentous stretching and contraction and deformity of the vertebrae and intervertebral discs, finally cause local stiffness—spasm—in the spinal column; which prevents voluntary correction of the curvature and interferes with its motions.

The varied regional flexibility of the spine and its deep situation in the thick muscles of the back make complete, immediate correction of any deformation difficult except when very slight. Again the continuous, intermittent expansion and contraction of the thorax and the lack of basic points of support make the application of a brace or corset, with good corrective influence and satisfactory supportive effect, well nigh impossible.

It is well to bear in mind that on account of its length, flexibility and supportive function even the slightest deviation from the normal may easily

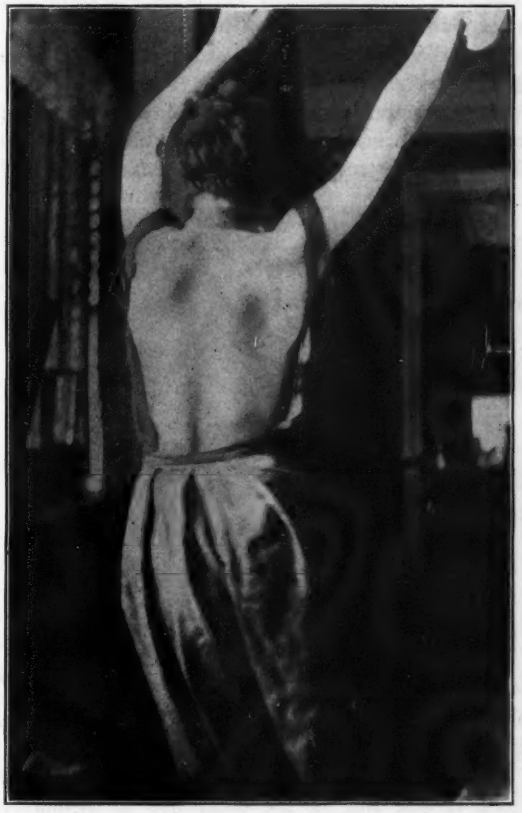


Fig. 1.—Swinging in circles, hanging from rings.

in time develop into lasting deformity; that outgrowing of a spinal curvature without assistance is usually out of question, and that early intervention is the safest means to prevent more or less marked ultimate body deformity.

I shall briefly consider the treatment of lateral curvature of early age, that due to disease of the spine, infantile paralysis, and that in connection with static deformity or following disease of the trunk or limbs.

Lateral curvature in early age, if sufficiently pronounced to be noticed, is generally due to rickets or congenital defect. If caused by the former it is necessary to improve the infant's general condition, overcome the rachitis, and keep the child in the

recumbent attitude on a gas-pipe frame until the condition has been entirely eliminated. It is better to use the portable frame than bed recumbency, as the child can be dressed over it and carried out and about with comparative comfort. If due to some congenital defect this must be corrected as far as possible and artificially replaced.

As to lateral curvature due to or in connection with disease of the spine, the latter is to receive our entire consideration; supportive, protective treatment being instituted and continued until and after it has been cured.

Infantile paralysis sometimes affects one or more groups of the spinal muscles, their consequent irregular activity upon the flexible columns soon causing deformity. As far as possible the palsy should be overcome; but in every case support of

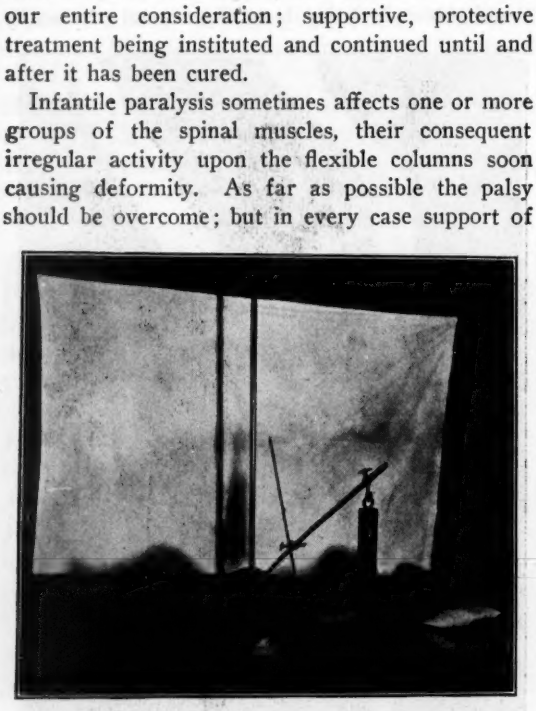


Fig. 2.—Keppler's apparatus for passive correction in single lateral curvature. Pad against concave side.

one sort or another—usually a light spinal brace—is indicated.

Static lateral curvature means deviation of the spine to one side or the other due to inequality in the length of the legs. In these cases the shoe of the short leg should be raised by means of a high sole and heel, and general exercises to strengthen the spinal muscles are advised as an adjuvant.

By disease or injury of the trunk or limbs, I refer to empyema, malunion of fractures of the upper limb, or destructive disease of some joint causing in time irregular function in body propulsion. Corrective support of the trunk or bracing of the distorted limb, combined if possible with strengthening movements carefully done, are the means of treatment in these conditions.

This brings me down to the consideration of the type of lateral curvature which generally comes under our observation, the spinal curvature of early youth, adolescence or adult life. These cases are brought to us with a very definite history as a rule entirely satisfactory respecting the cause of the deformity, or to the period of its existence. If in early childhood or adolescence the first thing known of the condition was that the school teacher noticed that the child sat crooked, or that the dressmaker found that one shoulder was higher or one hip larger than the other. In adults they usually have known that the spine was crooked but did nothing for it before, and come for treatment only on account of disability, pain, more or less severe, or the fact that others began to remark about their appearance. In these cases two modes of procedure in regard to corrective treatment are open to us. We have either that of:

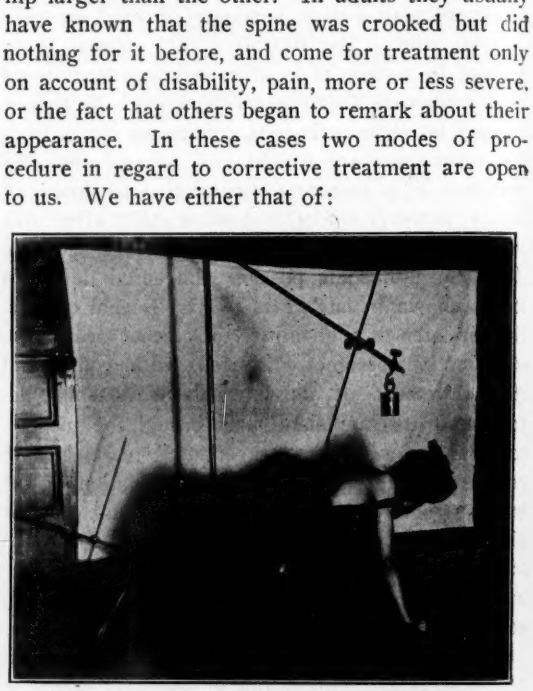


Fig. 3.—Keppler's apparatus. Active correction in single lateral curvature. Pad against concave side.

A. *Forcible correction with support either in jackets or braces.*

B. *Gymnastic correction* with or without brace support.

(A) *Forcible correction* is undertaken in some apparatus with a view to overcome the apparent deformity as far as possible. When this is reached, the body is held firmly corrected and one applies a snug plaster of Paris jacket encasing the entire trunk. This is left in place for a month or longer, and is then changed; again correcting another is applied and this procedure is repeated as indications demand. I judge it to be a questionable means of treatment to advise primarily. I believe that active, gymnastic treatment should first be tried for a time, and if this is found entirely insufficient then apply forcible correction as a last expedient. The only cases where this occurs is in the advanced, spastic rotary-lateral curvatures,

severe in type. Improvement in these spinal columns, with their deformed, partially ankylosed vertebrae and misshapen intervertebral discs is at best only slight, and it is a question whether forcible reduction, with the severe general strain attendant thereon, is sufficiently satisfactory to make it the elective treatment.

A jacket of the necessary weight and fit weakens the trunk muscles so much and interferes with the motions of the body so greatly that I have at times observed the necessity of its permanent removal. Again a jacket once applied usually means indefinitely worn, should we not want the spine to fall back into its original position; and gymnastic exercises to overcome this weakening have to be rigidly instituted when forcible correction is discontinued. All told, I have experienced nearly as good corrective results from general exercise treatment, and by far earlier and greater improvement in the general health of the patient. The apparatus used for forcible correction vary from the simple suspension frame with manual reduction of the deformity by assistants, to the more complicated pad and screw, strap and belt apparatus either in suspension or recumbency.

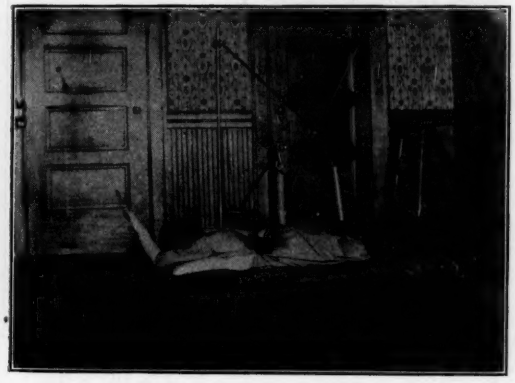


Fig. 4.—Keppler's apparatus for passive correction of double lateral curvature.

Before entering into a description of the active, gymnastic treatment I wish to take up the subject of braces. There has been to my knowledge no brace as yet made which in itself can correct lateral curvature. Their supportive action is all that can be praised. It is therefore apparent that the lighter such support is made the better it is, so long as it fulfills this demand; to weigh down a weakened, distorted spine is harmful. In the last few years I have been getting away from braces practically entirely, using instead for cosmetic effect in girls and women their own light corset with a pad where needed, and in boys light shoulder straps to remind them to retain the best erect position. The results have been quite satisfactory, and in several cases where a brace was removed when active treatment was begun, entirely gratifying. So much is certain—a brace cannot add to growth, is never fully effective in correcting fixed deformity, and tends by taking up the supportive function of the muscles and by interfering with their free motions, to weaken them materially.

B. *Active* (*gymnastic*) *treatment*: Essential to the successful correction of lateral curvature of the spine is the unbounded faith and complete assistance of the patient. The laws formulated for office and home treatment must be observed to the letter. It is not necessary to give individual treatment to children; although too many together again interfere with satisfactory observation and control.

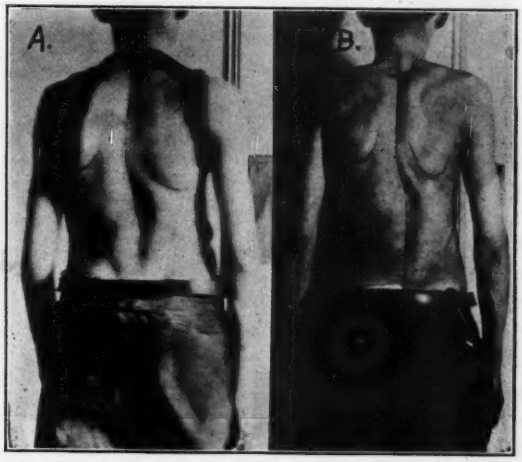


Fig. 5.—A. H., aged 13. Double rotary lateral curvature; marked spasm. Height, 5 feet 3 inches; weight, 104 lbs. Duration, 3 years. From fracture of arm. (A) Before treatment was begun. (B) Five months later; height, 5 feet 4 inches; weight 112 lbs.

But in a well arranged room six to eight can be fully managed, and they enjoy their work better in small classes. For adults I advise individual treatment.

All of the patients first take up the following general treatment: Individual exercises and corrective manipulations later as indicated. They wear a short gymnastic suit of which the back has been entirely removed to permit close observation of their attitude. Upon assuming their allotted places this attitude is corrected by touch and pressure until the best possible erect position is attained. This, by means of word or prod, is maintained during the exercises. The shoulders are held rather high and slightly back (the one of the low, concave side raised as high as possible), the stomach is drawn in, the lumbar spine held rather rigid, the chin straight forward.

Now the free exercises—to count—of head and trunk bending and leg motions are gone through and either medium heavy dumb-bells or wand exercises added. Immediately thereafter floor exercises are undertaken. This consumes about half an hour. The patients are now hung in a head suspension frame, or hung and laid upon the inclined plane. This consists of a broad board about six feet long resting at one end upon a base at a slant of about 45 degrees. The child lies upon it, on its back, the head gear fastened to hooks at its upper end; a hole large enough for the head near the hooks allows it to hang freely. After this rest-suspension, lasting about ten minutes, a few more general exercises are undertaken, such as hanging from the horizontal bar or from the rings with the toes touching the floor, swaying the body

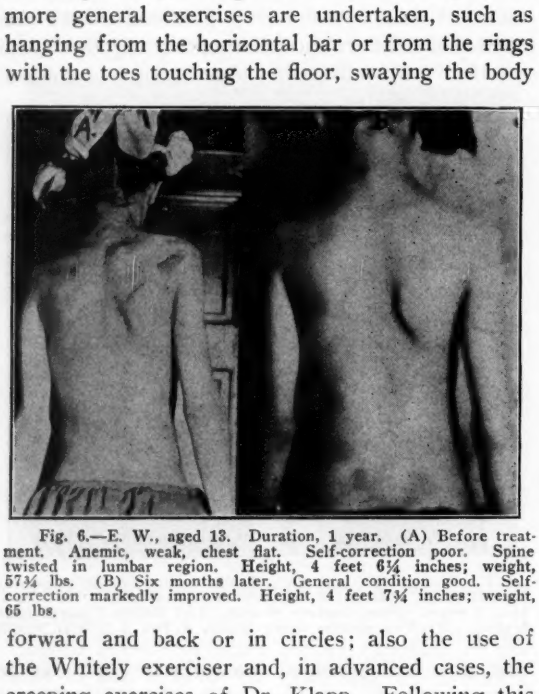


Fig. 6.—E. W., aged 13. Duration, 1 year. (A) Before treatment. Anemic, weak, chest flat. Self-correction poor. Spine twisted in lumbar region. Height, 4 feet 6¼ inches; weight, 57¾ lbs. (B) Six months later. General condition good. Self-correction markedly improved. Height, 4 feet 7¾ inches; weight, 65 lbs.

forward and back or in circles; also the use of the Whitely exerciser and, in advanced cases, the creeping exercises of Dr. Klapp. Following this active work of about one hour each case is thoroughly massaged, while lying fully relaxed, face downward on the massage bench. Sometimes—generally in spastic cases—mechanical vibration is added and trunk raising exercises are done while the feet are held either with or without resistance.

Heavy dumbbell pushing about the head with one or both hands is best developed only in the spastic rotary lateral curvatures where development and improvement of general health are of as great importance as correction. In general, simple cases they can act harmfully; and they should always be very carefully undertaken.

With the addition of several individual, special exercises and deep breathing, the usual treatment is over; but in resistant cases I have found the use of one or the other of the following apparatus very effective.

1. *The Wolm*: This consists of a large padded drum which slides upon two uprights and can be raised or lowered as desired. Over this the patient is drawn or bends backward over it actively, endeavoring to correct the curvature.

2. *The Sitz Rahmen*: The patient sits in a large frame upon a sliding seat. By means of straps the legs, hips, shoulders are fixed and the head suspended in a rope and pulley sling. First the spine by this means is drawn to fullest extension, then a pad with side-arms is placed against the projecting ribs of the convex side. In these side arms a rope and pulley arrangement is attached, traction is made and the projection corrected to

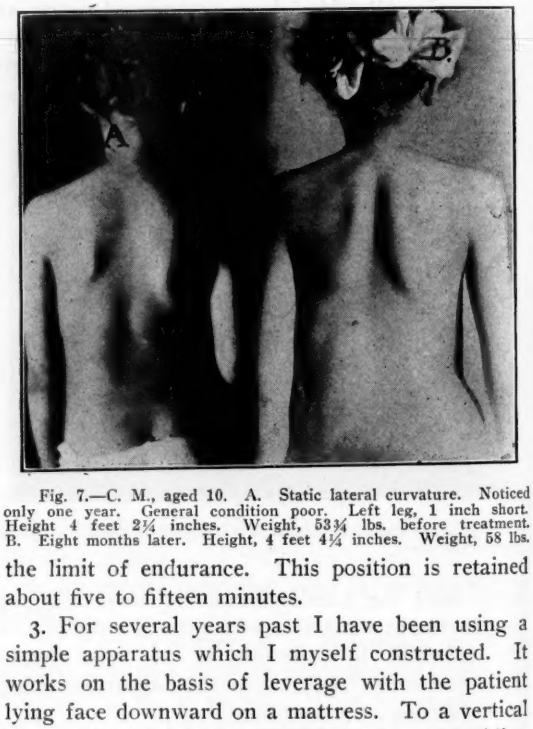


Fig. 7.—C. M., aged 10. A. Static lateral curvature. Noticed only one year. General condition poor. Left leg, 1 inch short. Height 4 feet 2¼ inches. Weight, 53¾ lbs. before treatment. B. Eight months later. Height, 4 feet 4¼ inches. Weight, 58 lbs.

the limit of endurance. This position is retained about five to fifteen minutes.

3. For several years past I have been using a simple apparatus which I myself constructed. It works on the basis of leverage with the patient lying face downward on a mattress. To a vertical bar two long arms are attached by means of sliding joints; and fastened to these are two smaller bars with the corrective pads. At the free end of each arm is a hook upon which the weight hangs. The patient lies in front of the machine, the convexity of the spinal curvature immediately opposite the upright base; if the curvature is a double one the dorsal deviation is placed thus. One arm is fastened very low upon the upright, the pad placed upon the rib projection at the point of greatest deformity; thus the arm rises, the weight is high, pressure of the pad is down and outward. The other arm is fastened high upon the upright, the

pad placed over the lower opposite deviation; it thus slants downward, the weight is low, the pad presses down and inward. The weights being attached—at first from five to ten pounds each, later up to twenty-five pounds—the corrective act is exerted, and is continued from five to ten minutes. In single curvature only one pad is used; in round shoulders a smaller pad is placed between the scapulae while the shoulders are raised by means of a sand bag placed under the clavicles; and the appartus can be used actively by placing the pad against the concave side, attaching a light weight and having the patient push up and outward against it intermittently.

To be effective, the active treatment has to be given at least twice or three times a week. The daily use of a few simple general exercises and some suspension apparatus is also desirable. In fact the home life of the patient must be well systematized, and the hours of school, rest, sleep and play regulated. The time of treatment varies; in simple cases good results may be obtained in about six months with occasional subsequent supervision; in severe and spastic cases no time limit can be set.

In submitting photographs of cases I wish to state that they have been treated entirely with active gymnastic work. No brace has been worn, nor is it now instituted, nor found necessary.

Unhappily many of the cases who come for treatment have advanced to rotary lateral curvature. This is wrong; for full correction can never again be obtained. In the simple early stage of deviation consistent treatment secures excellent results; this is the time, therefore, in which it should be begun. If incipient lateral curvature were always recognized, its correction would be easy and permanent. No deviation of the spine, however, should be allowed to try to outgrow itself; and close observation of children during growth and puberty should be made the rule instead of the exception.

2 WEST 86TH STREET.

WASTING TIME AT OPERATIONS.

It is better to all concerned to demonstrate pathology in the laboratory or in the specimen basin after the patient has been put to bed, than to waste valuable time in the midst of the operation, sectionizing a tumor, or to discuss pathology, at the patient's expense, with onlookers. I am a firm believer in extending all courtesies to my visiting doctor friends, but my first duty is to my patient, which can be best subserved by observing strictly surgical principles and avoiding that which jeopardizes his or her safety.—A. H. CORDIER in *The Lancet-Clinic.*

*FRACTURES—DISLOCATIONS OF THE SPINAL COLUMN.

W. L. ESTES, M.D.,
SOUTH BETHLEHEM, PA.

The continuity of the spinal column may be interrupted by: 1. Dislocations; 2. Fractures of the separate bones or of a segment of the column. In my experience a dislocation without fracture of some part of a bone in the column is so exceedingly rare that one need hardly spend time theorizing about conditions so seldom seen. I do not believe it possible for a dislocation to occur anywhere in the spinal column, except in the cervical region, without an accompanying fracture. As careful and reputable surgeons have reported a few instances of dislocations in the cervical region without fracture, I must accept this possibility. I myself have never seen such an injury.

I will confine my paper to fractures of the spinal column, and will of course discuss the condition of dislocation which nearly always belongs to these injuries.

Fractures of the spinal column are not of very frequent occurrence. An analysis of 5,037 injuries of all kinds which I have treated shows 37 fracture-dislocations of the vertebrae (I must say that fractures of the spinous and transverse processes without serious nervous symptoms are not enumerated in this). This would give a percentage of a little over 0.73 per cent. Dr. Walter Lathrop, in his address on surgery before the Pennsylvania State Medical Society in 1900, says: "From 1 to 3 per cent. of all fractures are those of the spine." This accords fairly well with my own experience.

Of the 37 cases of fracture of the spinal column I have treated, 25 were in the dorsal region, 7 were in the lumbar region, and 5 only were in the cervical.

Fractures of the spinal column occur usually from indirect violence in civil life; in military life they result most frequently from direct violence.

The ligamentous and muscular connections of the spinal column are so tremendously strong and continuous, and the resiliency and elasticity procured through the triple antero-posterior curves of the column act as such efficient buffers that it requires enormous force to fracture and dislocate the segments of the column. It is the rule, therefore, to have other serious injuries complicating fractures of the column which occur from indirect violence. Fractures from direct violence are usually much simpler injuries and much more amenable to treat-

* Read before the New York and New England Association of Railroad Surgeons, November, 1909.

ment than those from indirect violence, because the effect of the former is confined to a much more circumscribed area, and as a rule is not apt to involve neighboring structures.

Fracture. Fracture of the spine may be divided into: 1. Simple fractures. 2. Complicated fractures.

Simple Fractures. Under this head may be grouped fractures of the processes (the transverse and spinous) of a kind not to destroy the continuity of the column, and which result only in displacements of the fragments themselves. They occur most frequently from direct violence. Fractures of the bodies of the vertebrae without discoverable displacement may also be included under this head. These fractures produce nervous disturbances as a rule of a mild character, due to the pressure upon or irritation of certain nerve roots. Occasionally, however, severe paralytic manifestations may develop, because of displacement of fragments up the spinal cord, or from myelitis following slight injury to and persistent irritation of the membranes and cord. The especial thing to dread in these fractures, however, is hemorrhage upon or around the cord. I think the hemorrhages within the cord (hematomyelias) are more apt to occur in complicated fractures. So-called "concussion of the spine" I believe is nearly always a hematomyelia. I do not now refer to the traumatic neurites, with which this paper has nothing to do, but to the cases of temporary motor and sensory pareses, or even paralyses following a general benumbing of the whole body. These cases sometimes develop so gradually after an injury that the hemorrhagic nature of the lesion cannot be doubted. Other cases manifest the paretic or paralytic symptoms immediately, and they furnish most puzzling conditions for the surgeon to differentiate and to treat. I will again refer to this condition in speaking of the treatment of fractures.

Complicated Fractures. As I said before, by far the majority of fractures of the spinal column which occur in civil life are from indirect violence and are complicated. Under this head may be included: 1. Comminuted fractures, which are always attended with much laceration of the ligaments and muscles, usually considerable hemorrhage, and frequently lacerations of the cord and nerves. 2. Fractures of the bodies and pedicles with marked displacements, which invariably produce pressure upon, and frequently lacerations of the cord. 3. Fractures of any part of the vertebrae with marked hemorrhage about the cord or within the cord with consequent paraplegia. (This last may occur from direct violence.)

The immediate symptoms of injuries of these three classes are practically the same. The variations will depend usually upon whether the cord has been lacerated or pressed upon by displaced bone, or whether effused blood either within or upon the cord interferes with its function. As a rule paraplegia develops immediately, and there is at first a feeling of numbness over the whole body; unconsciousness sometimes supervenes, and physical shock is usually very marked. The anal and bladder sphincters will be paralyzed if the lesion is high enough up to involve their centers. If the lesion is in the neck or high up in the dorsal region, priapism may occur and be persistent. Usually there is great pain at the seat of the injury and sometimes there are lancinating pains through the nerves just above the injured ones; these pains are frequently referred to the peripheral distribution of the nerves. If the cord be torn across or complete transverse interruptions of its function occur through pressure, trophic changes begin very early. Vasomotor disturbances also occur early when the lesion is transverse and complete. Suffusion of the skin, erythemata, sweating on one side and a hard dry condition of the skin on the other, may be noted in many cases. I have found that the plantar reflexes are frequently very marked soon after a transverse lesion of the cord, with complete motor and sensory paralysis, and that this persists for several weeks, but gradually becomes exhausted. Babinski's sign is not found in acute injuries of the spine. The tendon reflexes are lost in complete transverse lesions, but may persist in partial destruction or injuries of the cord on one side. Fever rarely occurs for several days; then it may occur and is usually due to a cystitis or to a myelitis.

There are some important points in the symptoms thus hastily sketched which I will presently consider more closely, but as these concern especially differentiation from the purpose of determining proper treatment I will take them up under this head.

The local objective signs of an injured spine are: 1. Contusion or swelling at the seat of injury. 2. Distortion of the spinal column. 3. Displacement of a part of one or more bones of the column. 4. Immobility of the spine. 5. Sometimes crepitus may be elicited.

TREATMENT OF SPINAL FRACTURES.

1. *Simple Fractures.* While it is true that so-called simple fractures involve usually the transverse

or spinous processes, I am convinced that fractures of the bodies occur much more frequently than was formerly supposed. The danger as a rule is from hemorrhage. Except when they occur in the cervical region the prognosis is good. The condition usually called "spinal concussion" is apt to result as one of the immediate effects. I believe with Herbert Page that the phenomena and symptoms usually attributed to spinal concussion may all be explained by the phenomena of spinal hemorrhage. I think I have seen a few cases in which such slight hemorrhages occurred in and about the cord that they might categorically be called concussions; but except in very neurotic subjects or in persons of rheumatic or gouty diathesis I have never seen any permanent or persistent sequelae from these so-called concussions.

Simple fractures of the dorsal and lumbar region when the external processes alone are involved, require only gentle manipulation in an attempt to restore the fragments of bone to their proper places, and if this can be accomplished, fixation in position may be attempted by a thin compress and adhesive strips laid across. It is frequently impossible to restore these fragments to the proper places, but as a rule this is a matter of no great consequence.

Fractures of the bodies and pedicles of the dorsal and lumbar vertebrae without serious pressure symptoms require no effort at reduction; indeed, such efforts are dangerous and should never be made except when the seat of injury is laid bare by an incision, and one may see and feel just what he is doing and can know how far to move the bone.

Simple fractures of the cervical vertebrae are always grave injuries. If the bodies or pedicles are displaced, pressure symptoms develop immediately and the condition then belongs to the class of complicated fractures. Even if there is no apparent displacement, fractures of the cervical spine are followed by so much hemorrhage that very serious results may be expected.

Some time ago I had a case under treatment. The patient was a boy 14 years old, who, while going up in an elevator, projected his head; it was caught by the rim of an upper floor and was bent violently backward. It was an open way and a mere skeleton of an elevator which was used for carrying grain in a stable. After being violently bent over and thrown down he was released. He was brought to the hospital by the ambulance very soon after the injury, and when seen and examined presented the following signs and symptoms: He was completely paralyzed as to sensation from the nipple downward on the right, but retained sensation on the left side; he had excruciating pain about the 4th and 5th cervical vertebrae; there was swelling and discoloration chiefly on the right side of the 4th and 5th vertebrae, and exquisite tenderness at this position, and he was tender down the spine as far as the 8th dorsal vertebrae. The plantar reflexes were exaggerated if anything, and the knee-jerks also persisted. The sterno-ceido-mastoid and trapezius muscles were in tonic spasm; voluntary movements of the head were impossible and passive movements difficult and very painful. Breathing was entirely diaphragmatic. Careful examination of the neck failed to discover any distorsion of the spinal column; there was no displaced bone, and no process seemed out of its relative position; there was no crepitus.

In 24 hours sensation had almost completely returned on the left side, but it was absent on the right for several weeks. In about a week he could move the right foot; in two weeks motion began to return in the right upper extremity. About 2 months after the injury he could move both right extremities actively; he could flex the left leg and thigh, but motion in the upper left extremity was still absent. His deltoid and biceps muscles began to act freely. His anal and bladder sphincters at this time nearly recovered, but the sensation in the right lower extremity was still much below normal. There were no bed sores, but marked vasomotor disturbances on the right side.

This was undoubtedly a case of hemorrhage, I think, both upon and in the cord. He made a slow but complete recovery. I have had three cases of undoubtedly hematomyelia of the upper dorsal region in the last three years, all of whom died.

Cases showing evidences of bony displacement with pressure symptoms, in my opinion, demand an exploratory incision at once. I will discuss this further under complicated fractures. In case an operation is refused by the patient and his friends, it should be remembered that one may succeed occasionally in reducing the dislocation by manipulations. The patient's friends should be informed beforehand that the attempt is hazardous, and that it is possible the patient may die on the table. A general anesthetic should be used, and when under it the patient should be brought to the end of the table and be turned on his abdomen. Then he should be brought so far up that his head and neck are entirely beyond the edge of the table; then manipulation may be performed in such directions as the displacements seem to require. Usually traction on the head and alternately flexing and extending the neck with very gentle rotary movements

are the proper ones to be employed. While an assistant is making these movements, the surgeon in charge should attempt, by direct pressure, and gentle manipulation of the displaced vertebra or fragment of vertebra to return it to its place. By keeping his fingers continually upon the seat of injury the surgeon is able to estimate the result of the assistant's efforts and be ready to direct and to stop them at any time it seems necessary.

In making all the changes of position of the patient great care must be used to support the head and never to permit any separate movement of the head until everything is ready for the manipulations to begin. Another point to remember is that the breathing in these cases is chiefly diaphragmatic, so when the patient is turned on his abdomen he should be placed in such a way as to interfere as little as possible with the action of the diaphragm and abdominal muscles.

Fractures of the cervical vertebrae in the after-treatment absolutely require some fixation apparatus. The patient should be kept in a moderately firm, even surfaced air-bed, if possible. If the air-bed cannot be had, a smooth, even mattress without springs should be employed, and, as nearly as possible, a straight supine position be maintained for the first few weeks of the treatment.

Each case must have such fixation and retention apparatus applied as the individual indications require. As a rule some form of plastic material is necessary and some means of continuous extension should be employed. It must always be remembered that the shoulders should also be fixed to make the dressing complete; this is especially necessary if the deltoid muscles are not paralyzed.

I like to prescribe one of the bromides with ergot to be used for, at least, a week after the fracture. This seems to lessen the congestion and prevents restlessness. If all goes well, bichloride of mercury is substituted for the bromide and ergot at the expiration of a week, and is continued for several weeks if it does not disagree with the stomach or bowels of the patient.

Massage and passive movements of the paralyzed muscles should be employed as soon as the active inflammatory condition has subsided.

A patient should be confined to bed after these fractures until all pain and sensitiveness have entirely disappeared from the injured region, and until gentle and gradual passive movements show that no pain is manifested when the head is moved. About two months is the average period required in bed for these cases.

An apparatus for relieving the fractured region of weight and for restricting its movements should be employed for some time after the patient is able to be out of bed, and it should be worn as long as there seems to be the least difficulty of pain, when it is left off, tentatively, for a short time.

2. *Treatment of Complicated Fractures.* Complicated fractures of the spinal column, like all other fractures, must be treated according to each individual indication. The modern consensus of opinion of thoughtful surgeons who have had experience in treating these cases direct an early or an immediate, if possible, operation when pressure symptoms exist and there are indications that complete destruction of the cord has not taken place. While the treatment is practically the same, it is important to determine, also, if possible, in any given case, whether the pressure symptoms are from extravasated blood or from displaced bone. Hematomyelias are not benefited by operation, and we should try to determine the presence or absence of this condition as a primary cause of the paralysis before operating. This is a very difficult thing to do in many instances. I believe, however, the safest plan when in doubt is to operate and by careful exploration find out the conditions.

Only in the cervical region are attempts at reduction by manipulation to be thought of. Indeed, as I said before, these attempts in the cervical region without an open incision are hazardous, and should not be undertaken unless nothing else is permitted to be done. Manipulations, extensions, etc., or in other words, the procedures usually employed for reducing fractures of other bones, may produce great aggravation of the condition, and perhaps a fatal termination of the injury, by driving loose fragments down upon the cord, by increasing hemorrhage, or by complete disintegration of the cord, from tearing or overstretching it. The surgeon must act at once, however; determine, if he can, the condition in order to pursue the proper course of treatment. He must determine (1) whether the paralysis is one from hematorrhachis or hematomyelia; (2) whether from displaced bone, and if so, whether the cord is completely disorganized or not.

The gradual and slow development of the paralysis, the absence of any indication of fracture and dislocation, with the history of moderate direct violence, would indicate a hematorrhachis. Lumbar puncture may also be a valuable expedient in hematorrhachis (or hemorrhage upon the cord) and at the same time serve to relieve the tension inside the canal. Hematomyelia may be inferred if the paral-

ysis is higher up than the anatomical location of the injury would indicate it should be; if the paralysis is irregularly distributed, and especially if there is a marked cross-paralysis—that is to say, if paralysis of motion exists on one side and of sensation on the other, with marked vasomotor disturbances on the side of sensory paralysis. Also in hemorrhage the paralysis of motion spreads from above downwards and anesthesia travels from below upwards, (when the blood is absorbed the symptoms disappear in the reverse order). Thorburn, in speaking of hematomyelias, notes "that these hemorrhages are especially apt to affect the center of the cord, the grey matter, especially of the anterior cornua and the central canal. The symptoms produced by such a hemorrhage are divisible into two groups. We have destroying and compressing lesions, the former permanent, the latter more or less temporary." (Contribution to the surgery of the spinal cord.)

The history of the case—indirect violence—deformity, evidences of comminuted and displaced bone, and immediate and complete motor and sensory paralysis would indicate probably bony pressure. To determine, if possible, whether the cord has been completely destroyed in any given case is important, though since the publication of Drs. Harte and Stewart's celebrated case of successful exsection and reunion of a disintegrated spinal cord one does not feel the same absolute assurance that complete destruction of the cord is a contra-indication to any operative attempt. So far (as far as I know) there has been no other case of the kind reported. Notwithstanding then the indubitable evidence of this case, that same function may be restored to paralyzed limbs by taking the injured segment of the cord out and bringing the squarely cut ends together and suturing them in place, it is a fact that if the restruction of the cord resulted from indirect violence the case is practically hopeless. I will say a word further on this subject presently in speaking of the operation itself.

One should then obtain a history of the accident. Such indirect violence as results from falls from heights, or from moving trains, and the injuries resulting from blows by moving trains, locomotives, trolley cars, automobiles, etc., cause usually incurable conditions when spinal fractures and pressure symptoms are produced. Violent and exaggerated bending of the spinal column does not produce hopeless conditions, as for instance the case of the boy whose history I sketched; or as in another case of a man who while on a flat car in a mine came suddenly to a point where the roof was so low that he could not pass through in a crouched position. His shoulders were driven violently down and his dorsal spine was broken and displaced. Notwithstanding complete paraplegia he made a good recovery with almost perfect function.

The signs and symptoms of complete spinal disintegration may be misleading. Soon after the injury the shock to the cord and the hemorrhage magnify and intensify the symptoms; later on inflammation is likely to do the same thing. The local signs may also be misleading; as it is almost impossible to make a thorough examination of the injured area, it is obviously impracticable by the manipulations which are possible to discover the extent and degree of the fracture. *X*-ray examinations offer great assistance, but I must warn against accepting the shadows in an *X*-ray photograph as indubitable evidence of displaced bone. When the fluoroscope and at the same time careful palpation may be used a much more correct determination can be reached.

As to the nervous and peripheral signs and symptoms, complete paralysis of all nerves having their origin below the seat of injury* indicates complete disintegration or severance of the cord. Thorburn says when "the site of the lesion relative to the spine is already known, and where the anesthesia extends as high as this level, the lesion has destroyed both the cord and the nerve roots." Thorburn notes another point, viz., in a complete transverse injury of the cord there is a lower temperature on the affected side or part. He says "corresponding with the lower temperatures thus observed is the frequently noted dryness of the paralyzed limbs, resulting from a deficient secretion of perspiration and giving to the hands a deceptive sensation of warmth." Another point which I have noted is that in transverse complete lesions of the cord trophic disturbances begin very early and vasomotor paralysis is manifested very soon after the injury. Vasomotor and trophic disturbances are indicated by redness persisting and increasing under slight pressure, as for instance the heels from pressing upon the surface of even a water-bed, the skin over the knees from pressure of the bed clothing, and the end of the great toe from the same cause. This redness comes on in a few hours after the injury, and in twenty-four hours the heels and great toe frequently appear bruised, and unless the pres-

* In case of doubt as to the exact seat or location of injury to the spinal cord, the careful mapping out of the paralysis will determine the height of the injury. For instance, sensory paralysis extending to the level of the anterior superior iliac spine shows a lesion as high as the 7th dorsal, and anesthesia (with complete paraplegia) to ensiform cartilage shows a lesion as high as the 6th dorsal vertebra.

sure is absolutely removed a slough will be produced in the course of a few hours more.

Formerly it was enjoined—I myself have said—"If all these signs are present with undoubted fracture from indirect violence an operation will do no good." In the light of the experience of Drs. Harte and Stewart in the case I have referred to, one hesitates to make this statement so dogmatic. It must be borne in mind, however, that Drs. Harte and Stewart's case was a complete transverse lesion of the cord at the 7th dorsal vertebra from a *bullet wound*. It was, therefore, an injury from direct violence, and the injury to bone, ligaments, membranes, nerves and cord was much more restricted than in cases from indirect violence.

Dr. John B. Murphy, in a very exhaustive paper on "Surgery of the Spinal Cord," after reviewing the physiologic authorities and the minute anatomy of the cord, agrees with the writers he quotes, that transverse lesions of the spinal cord above the 2d lumbar vertebra cannot be followed by regeneration of the cord, because nerves are regenerated from the cells of the neurilemma and the nerve tracts in the spinal cord have only the axis cylinders. It is quite different with the cauda equina, however. The nerves forming this portion of the contents of the spinal canal have neurilemmas and may be regenerated.

Dr. Murphy's paper was read at the meeting of the American Surgical Association in 1906 after Drs. Harte and Stewart's publication, with full knowledge of this report, and must be considered a denial of their conclusions.

One actual occurrence must override all theoretical and purely experimental conclusions, however. There can be no question about the regeneration of some of the functions of the cord in Dr. Harte and Dr. Stewart's case, and certainly they were regenerated in the case of almost complete transverse lesion, upon which I operated ten years ago, the end result of which I give now.

What shall we say then? A study of the subject, and especially my individual experience in fractures of the vertebrae induce me to say, that, after all, the extent of the lesion in every case cannot by any, at present known, methods be accurately determined. There is a bare chance that if the irritating and pressing bone and blood be removed, even if the cord is lacerated, the patient may recover some degree of function. If nothing be done, the fatal results may be delayed for some time, but it is inevitable, and loss of function will continue until the patient dies. An exploratory operation, if it be properly done, adds nothing at all to the discomforts of the condition, and it may result in restoring partial usefulness to the limbs. I am, therefore, convinced that the best thing to do in the majority of cases of spinal fracture with dislocation and pressure symptoms is to operate as soon as possible.

As to the operation itself, there are two paramount indications: (1) The operation must be done very soon after the injury, and (2) a thorough aseptic technic must be employed. The immediate operation is demanded in order to forestall the development of a myelitis or a meningitis, the occurrence of either of which will surely make the operation of no avail.

In the 37 cases I have treated I operated 12 times. Of these 3 were cured, 4 improved and 5 died. Three deaths were due to myelitis which existed before operation and could not in any way, I think, be attributed to the operation itself. Two deaths occurred long after the operation wound was healed, from cystitis and ascending septic inflammation of the urinary tract.

I have done two complete and one partial exsection of the spinal cord. As a matter of interest, though it is not important at all, I should like to state that my first case of complete resection—I mean the resection of the whole thickness of the cord—was done in October, 1889, while Dr. Harte operated on his case evidently in 1901. His report was made in the summer of 1902, and the operation had been done at least 16 months before. He was in error, therefore, in believing and stating that his and Dr. Stewart's case was the first myelorrectomy and myelorrhaphy ever done. I made a complete section of a disintegrated cord, at the 1st lumbar vertebra, removed about three-quarters of an inch of the cord, squared off the ends, and brought them together with catgut sutures and sutured the dura mater over the united cord. The operation was done on the tenth day after an injury from indirect violence. (The man fell from a high telegraph pole.) The cord was lacerated entirely through, and many fragments of bone had been driven into the spinal canal. The man was considerably improved as regards the trophic and sensory disturbances, but never regained the use of his lower limbs.

In 1900 I again exsected more than half the thickness of the cord in the lower dorsal region at the level of the 9th and 10th dorsal, which was lacerated and entirely disintegrated by sharp spicules of bone. I left the anterior columns only intact, then I drew the ends of the lateral and posterior columns to-

gether by catgut sutures, and sutured the dura over the united ends. Sensory and trophic paralysis improved almost immediately. The 19-year-old boy finally recovered the use of his left lower extremity and the use of the flexors of the right extremity, so that with the aid of a steel and leather brace on the weak side he was able to walk with comparative ease. His sphincters almost entirely recovered. On account of an ulcer this young man recently entered the hospital again. His case is so important and suggestive, I add a full account of this end result of an almost complete transverse resection of the spine at the level of the 9th dorsal vertebra.

HISTORY OF THE CASE OF ALMOST COMPLETE RESECTION OF THE SPINAL CORD AT THE LEVEL OF THE NINTH DORSAL VERTEBRA.

Name—F. K.

Family History. The patient stated that he does not know the history of his grandparents, but his father was killed on the railroad at 33 years of age. His mother is living and well, and does not complain of anything more than an occasional abdominal cramp. None of the family ever suffered from tuberculosis or carcinoma, etc. He has four brothers and three sisters, all living and well, with the exception of one sister who died in infancy from convulsions. None of the brothers or sisters complained of any illness, except a brother who has had an attack of appendicitis.

Personal History. The patient, who is a white man, aged 29* years, single, has been a resident of Pennsylvania for 20 years, working as a slater in the slate region.

When young, he had an attack of measles. With the exception of this attack, the patient stated that he never was sick until the time of his injury, which happened May 30th, 1899 (10 years ago).

While attempting to board a moving train he lost his hold on the car while running along and was hit by the car next to the one he attempted to board; falling on the side of the track lengthwise, the grease box of the car hit him on the back and being too low to pass over him, dragged him to the edge of the crossing plank, where his head dropped between the railroad ties while the rest of his body was being pushed forward by the grease box. The lower part of his body was doubled up upon the upper part in such a manner as to fracture the spinal column at the 9th dorsal vertebra. Upon regaining consciousness, he found himself doubled up at the side of the track with his face upon the ground between his feet. Up to this time he had no pain; now, on rolling over on the ground and straightening his body, he suddenly felt a severe pain and a lump at the seat of injury.

The lower portion of his body below the seat of injury was completely paralyzed. Subsequently, the paralysis somewhat gradually disappeared in the left leg and certain areas more sensitive than others appeared. The left ankle remained completely paralyzed. The right leg improved somewhat until about a year after the injury, when he felt the presence of a foreign body at the seat of injury. Upon investigation it was found that a piece of gauze and an organized blood clot was remaining from a previous dressing. When this was removed, he felt a tingling sensation throughout the entire right leg. After the sensation he never had any sensation whatever in the right leg except an occasional twitch of the toes (which action, however, is involuntary).

He had incontinence of urine and feces for about a year after the injury. This condition gradually improved until he regained the power of his sphincters. This recovery is not complete, however, as the sphincters have not recovered their full tonicity.

At present he also complains of pain in the right leg, which is due to an ulcer of six months' duration. The pain is located mainly about the knee joint. This ulcer is the result of friction of his clothes while at work. The patient works every day as a "signal man" at a slate quarry.

PHYSICAL EXAMINATION.

General Appearance. The patient is a man of moderate build, measuring 5 feet 4½ inches in height, weight before injury 140 lbs., now 120 lbs. (He was formerly fairly well nourished, and of good muscular development.)

His glands are apparently normal. The bones and joints are of good formation, and no deformity, with the exception of those from his injury, exists.

Head and Neck. The head is of good formation and it is covered with a thick crop of dark brown hair. His eyes are well formed and the pupils react well. The nose is well formed and breathing is equal on both sides.

Mouth and Pharynx. He has a good and full set of teeth with the exception of 3 molars (1 upper and 2 lower) which are missing. The mucous membrane is of normal appearance. The buccal cavity is in good hygienic condition. The pharynx is normal.

Chest and Abdomen. The chest is of good formation and presents no abnormality. The abdomen is normal, with the exception of the deformity due to the injury. As a result of the injury there is a

* It must be remembered that this history was taken 10 years after the accident and the operation.

kyphosis and also a scoliosis, the scoliosis being toward the left side. The center of the deformity is raised and gradually tapers down. This deformity is a cone-shaped kyphosis, about 10 inches in diameter at the base. This is located at the level of the 9th dorsal vertebra. The center still shows the line of incision of the operation 10 years ago.

His internal organs are all in good functioning condition.

Genito Urinary System. The organs are in good condition, but have not the vigor they possessed previous to the injury.

The Pelvis. The pelvis is tilted laterally, the left side having ascended. The ant. sup. spinous process of the ilium on the right side is depressed. The right ant. sup. spinous process is 2 inches lower than the left. The thigh is flexed on the affected side, while the muscles of the thigh are markedly atrophied and flaccid. The adductors are the least affected.

The Left Lower Extremity. This limb has considerable motion. Its degree of paralysis is not as marked as the right leg is. The muscles are in a fair condition, atrophy and flaccidity not being very marked.

The knee joint is in good condition. The ankle joint is flaccid and has no voluntary action; it is in extended position.

The apparent length of this limb from the anterior superior spinous process of the ilium to the external malleolus is 33 inches. The measured length from the great trochanter to the external malleolus is 31½ inches. The circumference of the thigh, 8 inches above the upper border of the patella, is 14¼ inches.

The muscles of the leg are not markedly atrophied. The circumference of the calf is 11¾ inches.

The Light Lower Extremity. This extremity is almost completely paralyzed, having very limited motion. Occasionally involuntary jerks are noticed in different portions. It appears weak and atrophied.

The ankle is in a state of flaccidity, being slightly extended, the toes dropping.

The leg is partly flexed upon the thigh about an angle of 20 degrees. The knee is in a state of ankylosis, but is not painful to pressure.

The adductors have some motion left, the psoas magnus has most motion.

The apparent length from the anterior superior spinous process to the external malleolus is 31½ inches. The measured length from the great trochanter to the external malleolus is 31 inches. This is one-half of an inch less than the same measurement of the left extremity. This difference is due to the right leg being flexed at the knee joint.

The circumference of the thigh, 8 inches above the upper border of the patella, is 12½ inches.

The circumference of the calf is 11 inches.

Reflexes. All reflexes below the seat of injury are lost with the exception of a faint cremaster reflex present on the right side.

Bone sensation is markedly diminished on the right side, muscle sense is lost at the lower third of both legs. There is no sensation in the right limb, anteriorly, below the upper fifth of the thigh. In the left limb, sensation is lost at the lower third of the leg. This loss of sensation is the same on both sides anteriorly and posteriorly.

SPECIAL CONDITIONS. AREAS OF ANESTHESIA.

Left Lower Extremity. On the anterior aspect of the limb, there is an area of anesthetic to pain, extending from the lower portion of the thigh downward as low as the lower third of the tibia. In the upper portion of the thigh the area extends to the middle of the thigh, gradually tapering downward and outward at the knee joint, while below it tapers inward to the middle of the lower third of the leg, where it ascends upwards and inwards, then it runs inwards and posteriorly.

On the external aspect, with the exception of a small area anteriorly from the middle of the thigh to the upper third of the leg, a limited area is normal to pain and temperature, and a small area posterior along the back of the knee, the entire thigh and leg are anesthetic to pain and temperature. On the inner aspect the anesthetic area extends from the upper part of the thigh forward to one-half of the leg, gradually tapering down to the knee, from which it extends internally, meeting the area previously described.

Posteriorly, all is anesthetic except a narrow margin extending toward the inner side, meeting the area on the inner aspect.

Right Lower Extremity. This limb is almost entirely paralyzed, but has a small area on the upper part of the thigh, which is normal to pain and temperature. The area extends along the upper third of the thigh, slightly descending, reaching its lowest point on the inner side of the thigh a short distance below the upper third, thence tapering upward and outward, where it turns slightly downward. The rest of the limb is in a state of anesthesia.

On the posterior part of the body there is a short line of demarcation extending on the left side from the superior portions of the great trochanter upwards and inwards, reaching its highest point above the sacrum, then tapering downward to a point a

short distance below the great trochanter on the right side. This line is dome-shaped and the portions below is anesthetic and is continuous with the areas previously described.

Temperature sense and ordinary sensation are not equally well marked in all areas not anesthetic, and are all found in the same areas; there are no areas lacking any of these sensations. Muscle and bone sensation are normal in the left leg, but are impaired on pressure, except on the sole of the foot, also extending anteriorly up to the ankle.

Muscle sense is lost entirely below the ankle in both limbs.

Dr. Harte in a personal letter gives the status of his case at present:

November 12th, 1909.

DR. W. L. ESTES,

South Bethlehem, Pa.

My dear Doctor: In reference to the girl who was shot in the back, I find she is still living and able to be about.

When I say able to be about, I mean that she moves around with crutches, similar to Darragh wheel crutches. She also wears an apparatus to control the spastic condition of her legs.

Of late, she has not made any improvement.

I am,

Very truly yours,

R. H. HARTE.

The third case of myelorrectomy was for a gunshot wound at the 9th dorsal vertebra. The bullet lodged in the spinal canal and completely severed the cord. I exsected about three-quarters of an inch of the disintegrated cord and brought the ends and dura together as before. This case was the only one operated after Drs. Stewart and Harte's case was reported. The operation was not done until the eighth day after the injury, as the woman and her friends persistently refused surgical intervention until the last minute. Myelitis had already developed and the patient died. In the other cases operated, blood and bone pressed upon the cord, but did not sever it.

Dr. Lathrop, in his address on surgery before the Pennsylvania State Medical Society, session of 1900, reports 100 cases of operations for fractures of the vertebrae collected from various surgeons. Of these 15 were cured, 23 improved, 13 unimproved, and 49 died. This death rate is so high that it is evident the mortality came in many cases from the antecedent inflammations. It is stated in many cases that the death was due to myelitis which existed before the operation. All authorities agree that the operation should be done as soon as possible after the injury and the statistics bear out this advice.

Technic of the Operation. Laminectomy is not an easy operation, especially when done through lacerated and contused soft tissues and amidst a debris of torn ligaments, displaced bony fragments, etc. The operation is not in itself dangerous to the patient, however, if thorough asepsis be employed and maintained throughout. A careful, experienced anesthetist should take charge of the anesthetic. I think ether is best in these cases. The patient will require careful watching, however, especially when the lesion is high up.

The patient when under the anesthetic should be turned on his abdomen. In order to prevent respiratory difficulty a support of say six inches high should be placed under one shoulder (I use a longitudinal cushion, something like the Edebohls air cushion) to support and raise this shoulder off the table and thus leave space for the costal and diaphragmatic movements.

I have tried the three incisions ordinarily employed, viz.: (1) V-shaped; (2) H-shaped; and (3) the linear incision over the spinous processes. I like the last best. I think no osteoplastic attempt is necessary. In other words, it is not necessary to attempt to save and return the parts of the laminae and spinous processes removed. After dissecting through the skin and two layers of fascia the muscles may be separated by blunt dissection down to the deep muscles (erector-spinae); these must be cut through. Usually at this stage there is considerable bleeding. The hemorrhage may be easily controlled by a few hemostats and by firm retraction with blunt retractors on either side. Then the laminae may be cleared by periosteum elevators. I think a chisel ought not to be used in cutting through the laminae, as the jarring of the blows may do harm to the injured cord and may drive loose pieces of bone further into the canal. Strong cutting bone pliers or forceps, and a good rongeur afterwards, are best for exposing and clearing the spinal canal. After the cord is exposed one must adapt his subsequent procedures to the conditions of each case. If blood clots are found they must be cleared out, detritus of all kinds removed, all loose spicules of bone and shreds of ligaments should be taken away. It is very important to find out not only whether any displaced piece of bone is compressing the cord posteriorly—that is, whether any portion of the arches has been driven into the canal—but also to know whether or not the fracture has caused a bow-

ing backwards of the body of one of the vertebrae. Bennett says (Treves' System of Surgery, Vol. 1, p. 252): "The symptoms are in no true sense likely to be relieved by the removal of the laminae only, since they are mainly due to backward pressure on the cord from displaced fractured bodies forming the anterior wall of the vertebral canal." Simple laminectomy may not be sufficient, therefore, to relieve the pressure on the cord, which will in such cases be found curved over and tightly pressed against the rounded angle of the fractured body of the vertebra. I have seen this condition very strikingly shown in two cases. Urban (see Treves' work, as noted above) recommends resection of this premedullary angle. It is technically not very difficult to do, but I prefer attempting by manipulation to so far restore the fragments to their places that this bow may be relieved. When one has everything thoroughly exposed and the detritus cleared out, there is no special danger in manipulating the spinal column, both by various positions in traction and by direct pressure. If the dura is not injured and pulsation is distinct, it is best not to open it. In case the dura and cord are lacerated, I think careful clearing away of the lacerated parts by scissors should be done, and, if possible, the divided surfaces be sutured together afterwards. In case of complete section or complete transverse laceration of the cord, I would not hesitate to excise the injured part and bring the divided ends together again with sutures. The experience of Drs. Harte and Stewart in their one case and my experience in three cases show that this is technically possible. The brilliant outcome of Drs. Harte and Stewart's case, the improvement in my first complete case and the excellent result in the case of partial section, show that the functional (physiologic) result may also be good. I cannot here go into a discussion of the special technic of this phase of the general operation. I would refer those specially interested to the Transactions of the American Surgical Association, Vol. XX, where Dr. Harte's paper may be found as well as the discussion on the subject. I must say, however, that my experience has shown, and Dr. Harte bears me out, that as much as three-quarters of an inch separation between the ends of the sound cord may be overcome by traction sutures. I prefer always to make the dura help take the strain by shortening this and drawing it down correspondingly.

The after-treatment of operative cases is identical, practically, with that of cases not operated on, except, of course, the necessary dressings and attention to the wound. Except in fractures of the cervical region, no brace, splint or fixation apparatus is of any service; indeed, I think they are a detriment. A good air bed, and as nearly as possible, a straight, even dorsal position on the mattress, is the best method of preserving the position of the vertebrae. The greatest care must be exercised in nursing these cases. Absolute cleanliness, frequent bathing with alcohol, pads of various shapes and kinds when necessary to relieve and distribute pressure, should be used to prevent or mitigate bed-sores. In transverse lesions bed-sores will develop in spite of all one can do; however, the effort must be to limit these as much as possible.

I believe that regular catheterization of the bladder should be employed. The bladder should not be allowed to be over-distended. It must not be forgotten that the vesical sphincter is an elastic membraneous one and not a muscular one. If, therefore, it is once forced by over-distension, persistent dribbling of urine will occur, and the sphincter, even if the patient should recover, will rarely regain its tonicity. Further, I think the bladder should be washed out regularly with a weak antiseptic solution. All of these urethral and vesical manipulations should be done with the utmost gentleness and with the strictest aseptic precautions. Regular evacuations of the bowels should be obtained by the use of enemas; in this way frequent soiling of the bed may be prevented. Hexamethylenamine or Phenyl Salicylate may be given to prevent urinary decomposition. The early use of mercurial, after two or three days of bromide and ergot and continued for some weeks, seems to be of service.

Massage and passive movements may be begun for the paralyzed parts the second week, and be continued during the subsequent treatment. Faradism to the paralyzed muscles may be employed after the first month.

The flexors usually regain tonicity before the extensors do; one must watch carefully to prevent anchylosed flexures and distortions, and prevent too long continued flexion, or any malposition of long continuance.

The diet should be light and chiefly nitrogenous. The patient should be kept in bed from two to three months, sometimes even six months. When the patient is first allowed to sit up is the time a spinal brace or jacket is necessary and useful, and this brace or jacket must be worn as long as there is pain or discomfort in the back, and until no pain or weakness is felt when the brace is left off.

Prognosis. Fracture of the spinal column is al-

ways a grave injury. The fatality is greatest the higher up the lesion occurs. In cervical fractures, as the lesion is so near the medulla and the vasomotor centers, ascending inflammation is soon followed by death or rapid trophic changes, which soon usher in the lethal stage.

Fractures high up in the dorsal region are also very dangerous injuries and are attended by most uncomfortable phenomena. The lower dorsal region injuries allow better chances for life, though paraplegia may persist.

Fractures below the second lumbar vertebra offer the best chances for recovery, and the results of operative proceedings are much more encouraging. Moullin and Thorburn, especially the former, thinks this is the only region in which an operation is likely to be of any special service. As the cauda equina is much tougher and the separate nerves offer greater resistance to pressure, delayed operations may in this region be followed by good results.

The symptoms of injury to the cauda equina are sometimes very irregular and varied, and are well worth study. I refer those interested in this subject to a very thoughtful monograph by Dr. Chas. K. Mills, published in the *Medical News*, March 1, 1890; also to Thorburn's most careful and extensive studies of spinal injuries found in his book, "Contribution to the Surgery of the Spinal Cord," and to Murphy's exhaustive paper on "Surgery of the Spinal Cord," Vol. XXIV, Trans. Amer. Surg. Assoc., 1906.

To sum up—the death rate from spinal fractures is about 50 per cent. Early operation offers the only chance for life in case of complete transverse lesion high up in the cord; it may not only preserve life, but also in a few cases restore some degree of usefulness to paralyzed parts when the lesion is from the mid-dorsal region downwards. Delayed operations in these regions are usually of no avail.

Injuries below the second lumbar vertebra offer good hope for at least partial functional recovery from operative intervention. Even delayed operations may be of great service.

BIBLIOGRAPHY.

ESTES, W. L..: Treatment of Fractures.
HARTE, RICHARD: Trans. Amer. Surg. Assoc., Vol. XX.
LATHROP, WALTER: Address in Surgery. Penn. State Med. Jour., November, 1900.
MILLS, CHAS. K.: Med. News, March 1, 1890.
THORBURN, ——: Contributions to the Surgery of the Spinal Cord.
PAGE, HERBERT: Railway Injuries.
TREVES, ——: System of Surg. Vol. I.
WOOLSEY, GEORGE: Surgery of the Spine. Keen's System of Surgery. Vol. II, p. 816, et seq.
Woolsey gives a large number of bibliographic references at the end of his chapter.
MURPHY, J. B.: Surgery of the Spinal Cord. Trans. Amer. Surg. Assoc. Vol. XXIV, 1906.

LOCAL ANESTHESIA.

ARTHUR E. HERTZLER, M.D.,
KANSAS CITY, MO.

(Continued from the October number.)

TONSILECTOMY.

The removal of tonsils is an operation frequently demanded and one which has brought out an abundant discussion relative to the anesthetic of choice. Many operators have employed cocain and for fear of poisoning by this drug have done the operation in two or more stages. It is this operation in which quinine has an especial application. Any desired amount may be used with perfect safety. It must, however, be used in a systematic manner and a sufficient quantity of the fluid must be used so that all the sensitive areas may be reached. Since the tonsilar wound must heal by granulation there is no limit to the amount of fluid that may be safely employed. It is of distinct advantage to secure a peritonsilar edema. This defines the line of least resistance in the most perfect manner possible and by

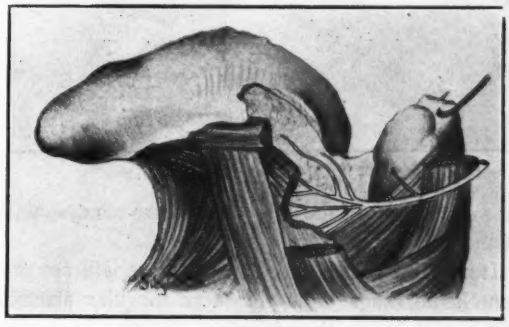


Fig. 1.

causing the tonsil to protrude makes it more easily grasped by the tenaculum forceps (or the tonsilitome, presuming that instrument is still in use).

The technic of the operation is as follows: After a preliminary spraying or swabbing of the pharynx with 2 per cent. cocain, paying particular attention to the anterior pillar and the adjoining surface of the tonsil, the injection with 1 per cent. quinine is begun. For this purpose a long needle must be used since there is not on the market a glass syringe with a long handle. The first injection is made at the junction of the pillar and tonsil with the needle directed backward and outward. Other injections are made below and above the preliminary injection, so that the entire peritonsilar area is infiltrated (Fig. 1). The region about the inferior pole of the tonsil is the most difficult to anesthetize, for it is here that the chief vessels and usually the chief nerves are found (Fig. 2). One tonsil having been

thoroughly anesthetized the other tonsil is injected in the same manner. The longer the interval between the time of injection and the operation the less the hemorrhage. After the second tonsil is infiltrated the operation upon the first may be begun. Either the knife or scissors, preferably the latter, may be used. The anterior pillar is first dissected from the tonsil, then under traction from the volcellum holding the tonsil the tonsil is quickly snipped from its bed. This is continued until the base is reached. Many operators prefer to use a snare for this part of the operation, but the writers have been content to use the Jansen bistoury. The operation may be completed with the scissors, but it does not adapt itself well to the angle between pillars and

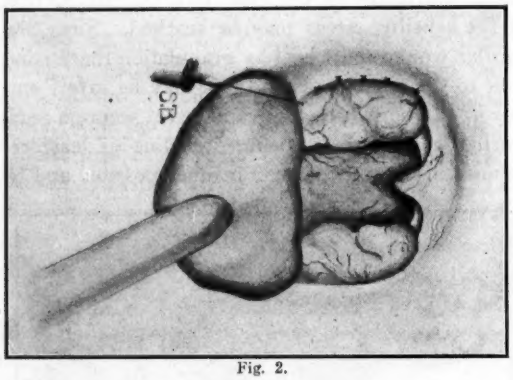


Fig. 2.

base of the tongue nearly so well as the narrow blade of the knife or the loop of a snare.

It need hardly be stated that quinine will not prevent hemorrhage from the large tonsillar arteries, but it will lessen the abundant oozing. It is particularly the late oozing which is prevented. Under cocain and adrenalin we have had oozing to continue for days. Under quinine we have not experienced this late oozing. Hemorrhage when it has once ceased has not recurred. It is not the hemorrhage that takes place at the time of operation that need cause the surgeon worry, but that which occurs after he has left his patient. Relative to the after pain, the writers are quite confident that it is much lessened if a sufficient time is allowed to elapse after the injection is made before the operation is begun. This point is particularly difficult to judge, for it is difficult to compare results, since patients differ so greatly in their estimation of the severity of pain.

Finally it is but fair to the writers to suggest that, judging from the reports of results from certain operators, quinine is only capable of producing anesthesia and does not, except to a certain degree because of the edema, supply a knowledge of the anatomy of the nasopharynx, nor does it lessen the value of experience in operative technic.

(To be continued.)

AN IMPROVED COMPOSITE CYSTOSCOPE.*

J. F. McCARTHY, M. D.,
Assistant Attending Genito-Urinary Surgeon, Bellevue Hospital; Instructor in Surgery, New York Post-Graduate Hospital.
NEW YORK.

Notwithstanding the great variety of cystoscopes already in use and the skill and dexterity in their manipulation by the respective authors, it has for some time been my conviction, that while the principles hold good, much still remains to be done in the perfection of details of construction, and in securing a greater facility in manipulation, and the largest field of vision compatible with the least possible movement of the instrument.

In the clinics abroad, as is well known, the indirect or prismatic type is the one almost invariably employed, little or no attention, with a few exceptions (E. R. W. Frank), being given to irrigation. In this country, however, the direct method has found much favor although in the last two years the indirect has come into more general use. In the latter types irrigating attachments have constituted an important feature.

While each method of examination and ureteral catheterization has its advocates, a cystoscopist should not restrict himself absolutely to any particular type but should cultivate, if possible, an equal degree of proficiency in both. One finds, however, a natural inclination to one or the other style and for reasons explained later my preference for general use is the indirect or prismatic instrument.

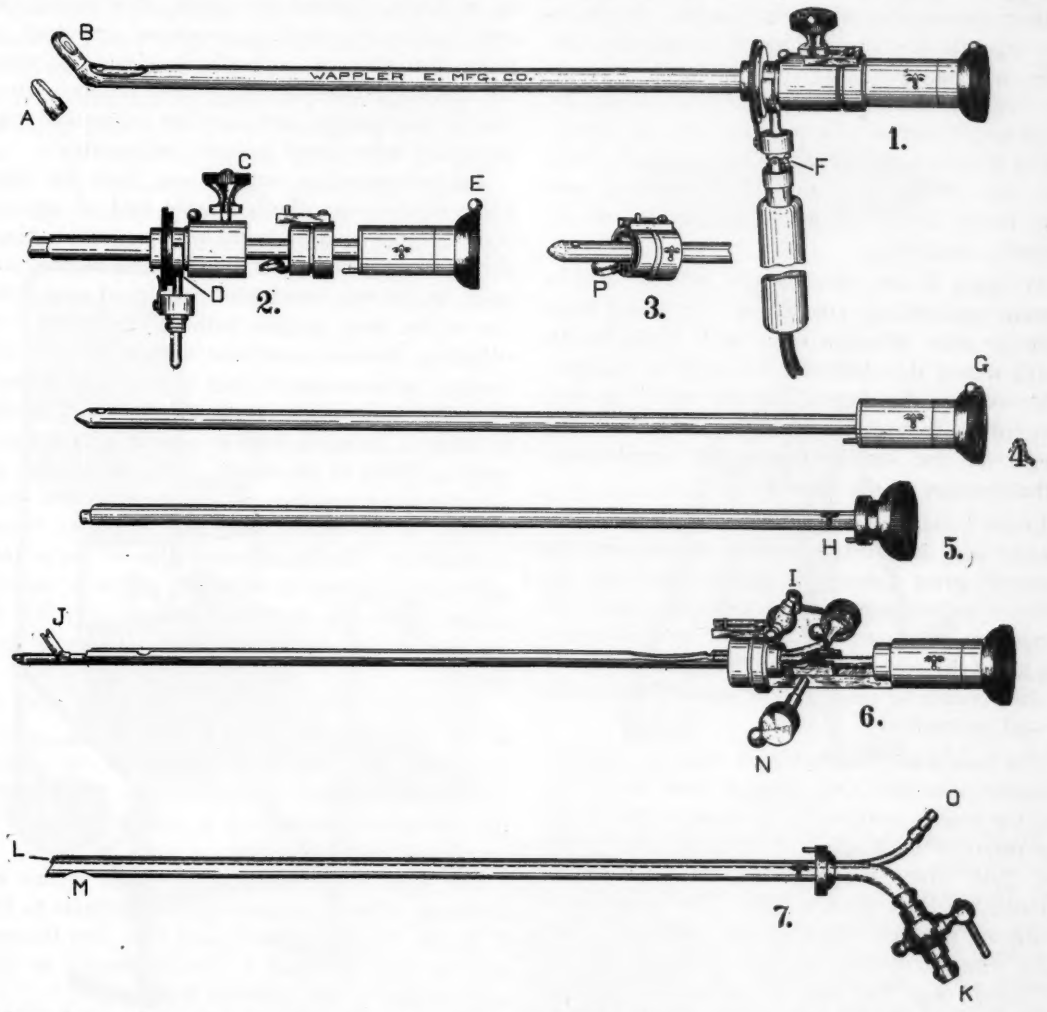
The cystoscope shown in the accompanying plate has a working length of seven and one-half inches, is of twenty-four French caliber, and permits of direct and indirect observation, indirect catheterization of both ureters, and real double current irrigation. It has a special detachable diaphragm or shutter, and a new and improved adjustment for make and break of current; (the latter being applicable also to the urethroscope, pharyngoscope and auroscope).

Fig. I shows the indirect telescope obturating the sheath in position, while at A and B are seen the single and double fenestrated lamps for indirect and direct work, the former being employed when or-

* Presented before the Genito-Urinary Section of the New York Academy of Medicine.

dinary indirect observation and catheterization are necessary, while the latter is used when a complete bladder exploration is to be conducted.

At F is shown an improved cable attachment. It consists of two parts, an upper carrying two tongues capable of easy adjustment to the sheath of the instrument and affording in this manner two



independent points of contact, and a lower, presenting a groove with a series of depressions into which fits the tongue of the attachment proper. As these depressions are alternately ivory and metal it will readily be seen that the break and make of the current may be had by simple rotation of the handle of the instrument in either direction until the projecting knob falls from one to the other of these depressions.

In figure 2, at D, is to be seen the upper section of the attachment above described, while at C is shown an endless screw into which the various telescopes may be adjusted and released without the customary jarring with its attendant traumatism. Letter E indicates the knob orienting the instrument. Here also is to be observed the valve or shutter detached from the sheath and carrying one of the telescopes. This valve is more clearly shown in figure 3, and constitutes one of the chief features of this cystoscope. It is detachable and when in position permits of the leisurely interchange of the double current irrigating tube and the direct and indirect observation telescopes with the loss of scarcely a drop of fluid; thus insuring a uniform bladder content and obviating the hasty interchange of the various parts or repeated filling of the organ, decided advantage in the conduct of cystoscopy.

Figures 4 and 5 show the direct and indirect telescopes, the former giving an erect picture such as is seen with the naked eye. The advantage of

this lens arrangement over the inverted type so commonly employed is too patent to necessitate discussion in this paper. Letter H shows a rod which fits into a corresponding depression in the diaphragm, its object being to afford absolute rigidity to the instrument as a whole.

Figure 7 clearly demonstrates the action of the double current irrigating attachment. It carries two separate and distinct tubes, the smaller (inflow) entering at O and emerging at L, prevents too sudden distention of the bladder, while the much larger outflow tube entering at M and emerging at K affords ready evacuation of mucus, blood clots, etc. In this way, and only in this way, may real double current irrigation be quickly and effectively conducted.

At figure 6 one observes the indirect double-current catheterizing attachment. At J is a large deflector after Albarran while at N is the handle which moves this deflector, which gives considerable sweep to the ureteral catheter and is so constructed as to prevent the latter from becoming caught in the sheath, during the simultaneous catheterization of the ureters.

Letter I indicates a stopcock through which the bladder may be filled or emptied at will, and the relatively great distance of the eye-piece from the catheter outlets reduces to a negligible factor the annoyance occasioned the operator by fluid spurting about the eyes, a state of affairs not uncommon in the presence of small bladder capacity or marked vesical irritability.

The instrument is introduced with its obturator (indirect telescope); the latter is then withdrawn, and the double current tube is placed in the sheath, the reservoir is attached to the small inlet, when the fluid after reaching the bladder emerges through the large outflow tube. This irrigation is continued until the washings are sufficiently clear, after which a definite quantity of fluid is allowed to remain and the tube is withdrawn, the diaphragm immediately closing, thereby preventing loss of fluid. This enables the operator to know, with just how much fluid he is dealing, and the sheath with its valve permits of easy and painless interchange of the direct and indirect observation telescopes or the irrigating tube with absence of jarring and no loss of fluid.

Should it then be found necessary to catheterize the ureters, the telescope last introduced, together with the diaphragm is readily removed by rotating the endless screw shown on the upper aspect of the sheath, following which the catheterizing telescope is placed in position, and the bladder is filled or emptied through its special stopcock.

In this cystoscope the indirect or prismatic type of ureteral catheterization is employed, because: in my opinion it covers a wider field of usefulness than the direct; it exerts less pressure upon the delicate structures on the floor of the deep urethra; by it, having located one ureter, it is easier (at least for the beginner or occasional operator) to locate the other; it is peculiarly adapted to prostatic cases, particularly where there is much intravesical enlargement, and to cases of marked trabeculation with lateral ureteral implantation.

The cystoscope, as may be seen from the foregoing description, affords a wide field of application. It may be used in the male or female bladder; its length renders it suitable also in prostatic cases, its smooth round bore permits of easy rotation in the deep urethra without traumatism; its irrigating features constitute a most decided advantage in this work; it gives a direct and indirect (upright) view of the organ, thereby enabling one to obtain a complete bladder picture with a minimum of tilting of the sheath. This tilting with its accompanying pressure on the deep urethra constitutes, in my opinion, the chief causative factor in infections. Double catheterization of the ureters with this cystoscope is relatively simple in uncomplicated cases, the catheters being readily left in the ureters by withdrawal of the telescope and sheath.

After an extended trial in a great many cases of all kinds I am fully convinced that for its numerous refinements, ease of manipulation, versatility, and the elimination of cumbersome attachments, this instrument constitutes a distinct advance in cystoscopic instrumentation.

For some of the ideas incorporated in this instrument, I beg to express my indebtedness to Dr. E. R. W. Frank of Berlin, and Drs. Leo Buerger and the late lamented F. Tilden Brown of this city; as also to Mr. Rhinold Wappler.

137 EAST 43RD STREET.

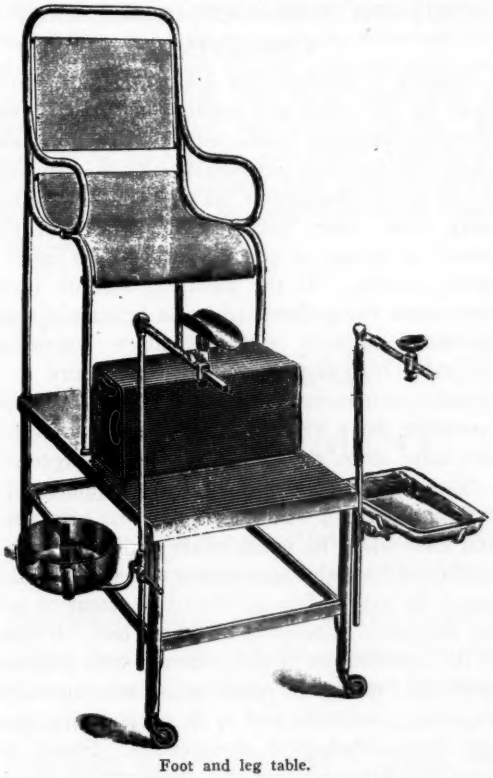
EXOPHTHALMIC GOITER.

I believe that the status lymphaticus really underlies many cases of exophthalmic goiter. It is this condition of lymphatism which contributes so largely to the immediate risk to life from operation in exophthalmic goiter. I do not know of any case where this quickly fatal result has occurred and an enlarged thymus has not been found.—HECTOR MACKENZIE in the *British Medical Journal.*

A FOOT AND LEG TABLE, A HAND TABLE, FOR USE IN SURGICAL OUT-PATIENT DEPARTMENTS.

WALTER M. BRICKNER, M.D.,
Assistant Adjunct Surgeon (and Chief in Surgical Department of Dispensary), Mount Sinai Hospital.
NEW YORK.

Affections of the hand and of the foot or leg constitute a very large proportion of the cases applying for treatment in surgical dispensary departments. Their management on a flat operating or examining table is not always convenient and, moreover, it hampers the prompt disposition of other cases. The dressing of leg ulcers, and the like, with the patients seated on a stool or chair, is a strain on the back of the physician or nurse.



Foot and leg table.

At the suggestion of Dr. S. S. Goldwater, superintendent of Mount Sinai Hospital, and with the cooperation of Mr. Bernard Thorner, of the Hospital Supply Co., I designed the two metal tables of which the accompanying illustrations are fairly explanatory.

The Foot and Leg Table or Stand.—The oblong block on the platform and at the foot of the chair can be removed altogether or set in sockets on its narrow or its wide surface; thus are provided three levels—for adults, small and large children—on which to support a foot, for operation upon its dorsum. This block and the platform itself are covered with rubber matting bound at the edges.

The adjustable supports seen at each of the proximal angles of the table bear, respectively, a heel cup and a leg cup. These are fastened at any point along the horizontal bars, by set screws and, in addition, the leg cup rests on a ball joint. Thus the leg and the heel supports can each conveniently receive either the right or the left extremity.

The solution basin and the instrument tray can be swung under the platform when not in use.

Hand table.

The Hand Table or Stand is of adjustable height. The top, fifteen inches square, bears a platform or tray, removable for cleansing, and perforated to permit the escape of pus, irrigating fluid, etc., into the receptacle below and therefrom through the hollow upright into the bucket beneath. The metal loops seen on two sides of the top are intended for bandaging the forearm to the table when dealing with frightened or refractory patients.

THE UNNECESSARY OPERATION.

To protect patients against unwise, incomplete and unskillfully performed operations is one of the many important obligations now resting upon the shoulders of the profession. Inability to interpret symptoms of diseased conditions correctly and faulty technic are to-day responsible for many unnecessary and unsuccessful operations.—F. D SMYTHE, in *The Memphis Medical Journal.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, NOVEMBER, 1910.

GERMICIDES AND ANTISEPTICS.

As the final step in the preparation of the field for operation one often sees the skin flooded or sponged with a strong solution of corrosive sublimate. The omission of this ceremony will demonstrate that it is unnecessary, and a little reflection will satisfy that it is quite or almost useless. In dealing with disinfectants we are too apt to think in terms of the test-tube and yet to forget the test-tube demonstrations of the lengths of exposure necessary to effect results. Far better than bichloride of mercury as a germicide on the field of operation is iodine, which is much more penetrating and many times more prompt in its action. As a disinfectant of the surgeon's hands sublimate, and most other germicidal solutions require immersion for several minutes—a procedure which, when often repeated, plays havoc with many skins. Again, on the mucous membranes and on wound surfaces germicidal solutions are useless or dangerous, (excepting, for example, a single or occasional application of iodine, alcohol, etc.), because they are altered by contact with the body fluids or because they are toxic or irritating. Reduced to strengths that are not injurious, these germicides become mere antiseptics.

This distinction to be borne in mind between *germicides,* which kill microorganisms within a more or less short time, and *antiseptics* which prevent or inhibit their growth, was recently emphasized by the Council on Pharmacy of the American Medical Association in its report on one of the somewhat recently discovered disinfectants, oxyquinolin sulphate ("chinosol"), which is pronounced *a very poor germicide,* but *an intense antiseptic.* Vain has been the search for chemicals which, germicidal *in vitro,* might be similarly applied *in vivo.* Clearly the paths to be followed are those that will lead to specific bactericidal agencies—perhaps antitoxic sera, perhaps drugs that will act on bacteria as quinine does on plasmodia, and as "606" and mercury do on spirochaetes. Meanwhile, for repeated application to infected surfaces we must content ourselves, when disinfectants are needed, with such as are antiseptic rather than germicidal, selecting those agencies that, for the individual tissue, are non-irritating and non-toxic in strengths of proven usefulness.—W. M. B.

SPEED, BOLDNESS AND BRILLIANCY IN OPERATING.

Visitors in surgical clinics are sometimes carried away by the speed and boldness with which some operation has been conducted. Their enthusiasm is often well founded, but occasionally it is furnished chiefly by the distance of the gallery from the operating table, which prevents the display of those errors of technic or judgment that have made the speed possible. If the admiring visitors learned how often the patients of some brilliantly speedy operators suffered with secondary hemorrhage, avoidable infection, disability from injury to important structures or relapses from incomplete operation, their "bold" surgeons would more properly come to be known as "bold bad" surgeons.

Speed without hurry is the accomplishment of the skilled technician who knows what he wants to do and knows how he wants to do it. Boldness is the quality of him who appreciates no less the limits to which he may safely go than the extent to which his individual handicraft can carry him. Brilliancy is the combination of these factors with originality, with the capacity to match quick wits against unexpected conditions and to fit physiological principles into pathological emergencies. Speed, boldness and brilliancy are the disiderata of all operators—the possessions of a few masters. They are factors in the saving of individual lives and in the development of new surgical fields. But when speed is mere hurry, when boldness disregards anatomy and flouts surgical principles, when brilliancy is but the quick move to cover errors of judgment, commend your body rather to the surgeon who is painstaking and deliberate, whose work is not "showy" in the operating room—nor on the autopsy table!—W. M. B.

THE CHICAGO CLINICAL MEETING OF SURGEONS.

We commend and await with much interest, the "Clinical Meeting of Surgeons of North America," which has been planned by the editors of *Surgery, Gynecology and Obstetrics,* to be held in Chicago from November 7th to 19th, 1910. During that fortnight surgical clinics will be conducted at the various Chicago hospitals during the day, and special programmes will be followed at meetings of medical societies in the evenings.

The exchange of visits among surgeons is a growing habit and a very healthy one. The general operative procedures adopted by the leaders of surgery can be learned from their text-books and monographs, but those technical details that often mean so much in ultimate results can be learned only by actual observation. Every operating room has some methods peculiar to itself—bad ones and good ones. Every practised operator has some maneuvers, devices, "wrinkles," that are worth copying, and some that he can improve upon; and a surgeon can scarcely visit a colleague's clinic without carrying fresh ideas to him and bringing home others equally useful.—W. M. B.

EDITORIAL ANNOUNCEMENT

SPECIAL SOUTHERN NUMBER OF THE AMERICAN JOURNAL OF SURGERY.

The January issue (1911) of the AMERICAN JOURNAL OF SURGERY will be a special Southern edition devoted to articles contributed by leading Southern surgeons.

Continuing the policy adopted in March, 1909, when the Greater New York number was published, to print special numbers during each year devoted to contributions from the pen of leading surgeons of certain territories of the country, we are pleased to announce this Southern number which will be headed by an article from Prof. Howard A. Kelly, of Baltimore. At a later date we will publish a full list of the articles to appear in this number.

Surgical Suggestions

Persistent lymphedema of the breast may be the first, and for a long time the only sign of a scirrhus carcinoma.

A small swelling in the parotid region may be an inflamed lymph-node. A single focus of tuberculous lymphadenitis is sometimes to be found here.

Rupture of the urethra occurring between the posterior layer of the triangular ligament and the scrotum is one of the most serious accidents in surgery, and demands immediate operation.

Overdistention of the bladder due to neurasthenia, hysteria, shock or prolonged voluntary retention may be overcome by administering a rectal enema consisting of a pint of warm water and an ounce of glycerin.

The passage of a sound or catheter into a tortuous or narrowed urethra is facilitated by injecting the urethra full of sterilized olive oil.

In acute posterior gonorrhea with frequent urination and all portions of the urine cloudy, if these symptoms do not respond to irrigations of the bladder, gently massage the prostate—the expression of pus will indicate repeated massage as the treatment to be pursued.

Prostatic massage for gonorrheal prostatitis is not limited in its usefulness to chronic cases. In *some* cases of fairly acute gonorrheal prostatitis the symptoms do not abate until daily expression of the pus by massage is undertaken, and then they subside very quickly. Such a treatment must be undertaken only upon proper indications, however; otherwise employed in acute cases it will cause mischief.

In a case of known or suspected visceral carcinoma, the finding of small nodules in or just beneath the skin is of vast diagnostic and prognostic importance. If an excised nodule is shown to be cancerous this will at once establish both the diagnosis and the futility of operation. In cases of intra-abdominal carcinoma these superficial metastases are curiously, most often found in the skin to the left of and below the umbilicus.

Surgical Sociology

Ira S. Wile, M.D.
Department Editor.

Nero fiddled while Rome burned. There are similar evidences of indifference to the results of conflagrations at this period of the world's progress. A Chicago fire or a holocaust like that at San Francisco arouses public sympathy and "makes the whole world kin." An Iroquois Theatre catastrophe calls forth an investigation, but the victims are beyond aid. A public school burns and from the shrieks of injured children is born an agonized cry for better fire protection in the public schools. The General Slocum takes its toll in women and helpless babes and promptly there is a hue and cry about rotten fire hose, worthless life preservers, and inefficient steamboat inspection. The great glow of the withering forest fire that devastates all it touches reflects the need of fire protection. The panic in the factory when smoke and flame strangle reason, and when the desire to live overrides judgment adds a list of the injured to the total lost in the ruins. The pathetic spectacle of an orphan asylum offering up victims, as in a sacrificial ceremony to the spirits of the flames, first engenders widespread pity and then creates a demand for the prevention of such preventable losses. Human lives are wasted and human forms maimed unnecessarily, and the merry world pauses for a moment and then goes on fiddling.

Burns of the first degree affecting two-thirds of the cutaneous surfaces inevitably are fatal. The destruction of one-third of the skin of the body is also attended by fatality. The number of deaths from burns does not tell the whole story for there are horrible scars and fearful contractures that tell of the surgeon's partial triumph over the flame.

Over 3,000 lives are lost annually in the registration area of the United States through fires. If one looks at another phase of the fire loss the terrific damage to the country can be better appreciated. According to the United States Department of Commerce and Labor, the per capita fire loss in this country is $2.58 as compared with the per capita cost in six European countries of $0.33. The great cost of fires is more startling upon realizing that in this country there are forty fires to each 10,000 population while abroad the ratio is only eight per 10,000.

Not alone is there an enormous wastage of life, but the cost of upkeep of the fire departments is extravagant and excessive. The fire department of tne city of Boston costs $2.51 per capita, while London pays $0.19, Paris $0.21, and Budapest $0.08 per capita. Proper care in home, factory, shop, and storehouse would lessen the extent of fire losses, in money and lives, decrease the tax upon hospitals and dispensaries, and leave a larger sum available for the construction of much needed city hospitals for general or specific purposes.

In 1908, 3,688 persons died from the result of burns and scalds. The annual death rate per 100,000 for the period 1900 to 1908 was 8.2. The relative importance of this rate can be judged by noting that it is higher than the rate for deaths from smallpox, angina pectoris, epidemic cerebrospinal fever, abdominal tuberculosis, gastric ulcers, heat strokes or acute nephritis. To the above death total may be added the losses from the inhalation of poisonous gases, including conflagrations, which totaled in the same year 1,688, or a rate of 3.7 per 100,000.

As might be expected in part the losses are greatest in cities. In the registration states, during 1908, there were 1,757 deaths from burns and scalds in the cities as compared with 1,264 in the rural districts. The rate is 9.0, as compared to 7.2 per 100,000. In New York State the city rate was 8.2, while the rate for the rural districts was 5.3, and Massachusetts showed 8.8 and 5.6 for similar areas.

The death rate from conflagrations per 100,000 in New York State cities was 1.6 and 1.1 in the rural districts, while in Massachusetts the rates were 1.6 and 1.5.

A very sad part of the losses from burns and scalds lies in the fact that so many children are included in the number. Of the 3,021 who were thus lost in the registration states, 1,731 were under twenty years, and 1,332 were under five years of age.

Fire insurance companies maintain effective salvage corps in order to lessen their liability for the losses incident to damaged goods. What a great gain there would be to the community if some steps were taken to salvage human beings. The losses from fire as estimated in burnt flesh are scandalous. Adequate fire protection must be demanded in every place where large groups of people are gathered, no matter what the nature of the assembly place may be—hospitals, dispensaries, sanitoria, convalescent homes, factories, prisons, almshouses, schools, boats, theaters, churches, and all other institutions like nurseries, and orphanages, where the responsibility for the safety of others must be appreciated. The tenement houses should have every available sort of protection as well as the crowded shops. Fire escapes, stand-pipes, and extinguishers are not sufficient. There must be a systematic, often practiced fire drill. Fire rules should be posted in every building, even though it may perchance be of fireproof, or more accurately of slow burning construction. The deaths from fire can be prevented and every surgeon can help to prevent them by raising his voice for better building laws, more efficient fire departments, compulsory fire drills, and the utilization of trained fire fighters for the purpose of schooling the masses in the proper methods of self-protection in the midst of smoke and flame. There are many therapeutic opinions as to the best way to treat a burn, but there can be only unanimity as to the necessity and value of preventing this constant trial by fire.

Book Reviews

A Treatise on Orthopedic Surgery. By Royal Whitman, M. D., Adjunct Professor of Orthopedic Surgery in the College of Physicians and Surgeons, New York; Professor of Orthopedic Surgery in the New York Polyclinic; Associate Surgeon, Hospital for the Ruptured and Crippled, New York. *Fourth edition.* Octavo; 908 pages; 601 illustrations, mostly original. Publishers, Philadelphia and New York: Lea & Febiger, 1910. Cloth, $5.50 net.

The merits of this work have been presented in reviews of earlier editions. In this, the fourth edition, Whitman has subjected his text to a general revision, enlarging the book by 31 pages and introducing about 50 new illustrations. Many of the changes are but slight. Others are sufficiently extensive to include more or less condensed references to recent advances.

Thus under *cubitus valgus, cubitus varus,* is included a reference to, and an illustration of, the author's plaster shoulder spica for use in the reduction of lateral deformity at the elbow or upper arm. Under *obstetrical injury to the brachial paralysis* is to be found description and illustration of Taylor's method of operation. The description of the manifestations and treatment of *periarthritis of the shoulder* has been modified by withdrawing the reference to Amidon's suggestion of circumflex neuritis, by somewhat expanding the note on subdeltoid (better subacromial) bursitis and by introducing an illustration of the bursa, borrowed from Baer's article. Whitman briefly describes the operation for (subdeltoid) bursitis, which may be done, he says, "in cases in which it is evident that the symptoms are caused by a congested and thickened bursa." This is altogether too broad. No reference is made to the service of the *X*-ray in the diagnosis of a thickened or calcareous bursa. The description of its signs is very meager indeed, and, altogether it would seem that Whitman has scant first-hand knowledge of the condition. This is unfortunate for in just such a work as this the author had an excellent opportunity to present what would be eagerly read—an intelligent discussion of the diagnosis and treatment of those conditions that are to be found in that very common and distressing affection, "painful shoulder."

While the typography and general appearance of the book are, as before, very pleasing, it is not free from errors. Thus in the footnote on page 495, Codman is spelled Cadman, and the value of figure 333 (from Taylor) is lost to the reader by the fact that while the structures are indicated by numerals in the plate they are referred to by letters in the legend.

We repeat our commendation of the third edition. In this issue an excellent work has been brought up to date. We still regard it, however, as a textbook, and not as a "treatise" in the proper sense.

Medical Electricity and Röntgen Rays. With Chapters on Phototherapy and Radium. By Sinclair Tousey. A.M., M.D., Consulting Surgeon to St. Bartholomew's Clinic, New York. Large octavo; 1,116 pages; 750 illustrations (16 in colors). Philadelphia and London: W. B. Saunders Co., 1910. Cloth, $7, net; half morocco, $8.50, net.

In this book, which contains about 1,050 pages of text, the author has attempted to cover the entire field of medical electricity and radiology. He has been fairly successful in giving an almost encyclopedic account of the subject. The numerous illustrations and diagrams are very well chosen, and help greatly in the understanding of many of the technical discussions. Some of these, however, involve a question of good taste because the author's picture appears quite frequently.

The first half of the book is devoted to medical electricity, and treats in a concise and direct manner of static and dynamic electricity, of electricity occurring in animals and plants, of the physiologic effects of electricity and of electropathology. Much space is given to Ionic Medication by Electrolysis and to Electricity in Diseases of the Nervous System, both of which chapters contain much valuable information.

The second half of the book is devoted to the Röntgen Rays, which the author persists in calling *X*-rays because Röntgen himself was too modest to name them after himself. (In this attitude there might be a hint to Dr. Tousey.)

As was naturally to be expected, the most interesting and valuable chapter in this part is that on the Röntgenography of the teeth and maxillae, of which the author is past master. The allusion to dental fluoroscopy, against which the author advises, ought to have been omitted altogether, as well as the fluoroscopy in frontal sinus work. Too much stress cannot be laid upon the futility of this method (which is dangerous to patient and to operator), in conditions which do not require the study of motion, as pulmonary, cardiac or gastro-intestinal examinations.

Figure 628 illustrating fluoroscopy of the chest ought to have been omitted from an up-to-date book. Besides the very crude method of using the small cryptoscope it shows a naked Röntgen-tube, and indicates no method of protection of patient or operator.

Tousey's cellular diaphragm presents no advantage over any of the others in use, but appears to have the disadvantage of introducing an additional shadow where one is least desirable.

Nothing new is presented in the chapters on Röntgenotherapy and radium.

Cystoscopy as Adjuvant in Surgery. An Atlas of Cystoscopic Views and Concomitant Text for Physicians and Students. By Staff Surgeon Dr. O. Rumpel, Lecturer in Surgery at the University of Berlin. Only authorized English Translation by P. W. Shedd, M. D., New York. Quarto; 131 pages; 85 illustrations in color on 36 plates, and 22 text figures. New York: Rebman Co., 1910. Half leather, $8.50.

This is a worthy contribution to the series of cystoscopy atlases recently published. The illustrations are excellent color reproductions of the images presented in the most common types of bladder lesions. Of especial interest are those showing the various forms of vesical tuberculosis. These colored illustrations are circular prints pasted two and three on a page. In the reviewer's copy some of the pictures are pasted upside down.

The text deals only with some of the conditions to be found—congenital anomalies, diverticula, etc. There is no description of cystoscopic methods or technic.

Symptomatic and Regional Therapeutics. By George Howard Hoxie. A.M., M.D., Professor of Internal Medicine and Dean of the Clinical Department in the School of Medicine of the University of Kansas, etc. Octavo; 499 pages; 58 illustrations. New York and London: D. Appleton & Co., 1910. Cloth, $4.00.

This work is written on original lines and presents much useful information in a convenient form. It is intended chiefly for the student, and it was built to follow the curriculum adopted by the Committee of Education of the American Medical Association, and the Curriculum Committee of the Association of American Medical Colleges (of which latter association the author is president).

The book is divided into three parts. Part I (General Therapeutics), is devoted to the therapeutics of symptoms—pain, fever, itching, insomnia, etc., etc., and of inflammations (of the various body tissues seriatim). The pathological significance of and variations in, each symptom are considered in some detail.

Part II deals with regional therapeutics, discussing the therapy of diseases and disorders of the various regions and tracts of the body. Here, as in Part I, the author endeavors to elucidate the physiologic basis for the internal and physical remedies used. While essentially a medical work, many surgical affections are also included, e. g., prostatic and bladder inflammations, peritonsillar abscess, bone sinuses. Indeed the chief defect of the book is its attempt to cover too broad a field—to the detriment of a satisfactory presentation of its various parts. Part III deals with the materia medica itself and includes notes

on newer remedies, and the analysis of various medicinal waters.

The work is better in its conception than in its execution, which in several places is quite crude. Thus edema of the lungs is dismissed with a few lines (page 144). The condition is thus defined: "Edema is essentially a (*sic*) overflow of blood from the pulmonary vessels." Most people would consider such a thing a pulmonary *hemorrhage*. "The treatment," says Hoxie, "consists in relieving the local high blood pressure. The most effective method is * * * phlebotomy. Next we seek to stimulate the contraction of the vascular walls by using intravenously * * * adrenalin. If bubbling râles indicate the presence of considerable fluid * * * aromatic spirits of ammonia should be used in teaspoonful doses frequently repeated." That is all! Why is not the student told that phlebotomy is often contraindicated by the patient's general condition? Why no mention of that invaluable drug morphine, or of those most useful remedies, atropine, nitrogylcerine (which we should much prefer in pulmonary edema to its antagonist adrenalin), cupping the chest and constructing the veins of the extremities? After phlebotomy and adrenalin does Hoxie really find nothing to do for those ominous bubbling râles but to pour aromatic spirits of ammonia down the throat?

We venture to suggest also that the few bibliographical references should have been to original sources. (The description of Beck's bismuth paste injections is referred to Baer's article in the *Johns Hopkins Bulletin.*) The illustrations are crudely executed. One pair of them (figures 22 and 23), taken from a familiar source is quite amusing. They portray the application of a clay poultice in pneumonia, the patient cheerfully standing ercet, with arms akimbo!

Atlas und Grundriss der Zahnärztlichen Orthopädie. Von Zahnarzt EMIL HERBST, D.D.S., Bremen. Duodecimo; 395 pages; 3 plates and 438 illustrations, in part colored. Munich: J. F. LEHMANN, 1910. Price, 14 Marks.

The work is a thorough exposé of the subject, prepared for students and practitioners. The field is a comparatively new one, and the author, laying aside all antiquated methods, devotes himself to a presentation of up-to-date methods only. It is of interest to note the frequency with which Herbst draws from American writings on the subject.

The writer deals systematically with his subject, devoting the first part of his book to an anatomical and topographical survey of the teeth, the maxillae and the surrounding organs; then discussing physiological and pathological considerations; and, finally, the anomalies, the etiological factors in deformities and the methods of diagnosis. In the second part of the book, the various mechanical and non-mechanical devices for the treatment of the deformities are taken up in detail. At the end of the work is an excellent chapter on technic.

Too much praise cannot be given to the publisher for the clearness and beauty of the illustrations.

Physiology and Pathology of the Semicircular Canals. Being an Excerpt of the Clinical Studies of DR. ROBERT BARANY with Notes and Addenda gathered from the Vienna Clinics by ADOLPH E. IBERSHOFF, M. D., with Foreword by ROYAL S. COPELAND, A. M., M. D. Duodecimo; 64 pages; 8 illustrations. New York: PAUL B. HOEBER, 1910. $1.00 net.

Nystagmus, which has until recent years been associated almost entirely with congenital or acquired optical defects, or in an indefinite way with lesions of the inner ear, has become one of the most important aids in differential diagnosis and has greatly amplified the scope and efficiency of the aurist.

The little monograph at hand deals almost entirely with nystagmus in relation to its bearing on labyrinthine disease. A precise and clear explanation of turning nystagmus is first given, then caloric nystagmus and finally galvanic nystagmus. The last sixteen pages deal with acute destruction of the labyrinth and nystagmus of intracranial origin.

A perusal of these few pages gives one a very clear understanding of a subject whose importance is just beginning to be appreciated.

Post-Mortem Manual. A Handbook of Morbid Anatomy and Post-Mortem Technic. By CHARLES R. BOX, M..D,, B.S., B.Sc., Lond., F.R.C.P., Lond., F. R. C. S., Eng. Physician to out-patients, St. Thomas's Hospital, and Assistant Physician to the London Fever Hospital; Lecturer on Applied Anatomy and Demonstrator of Morbid Anatomy, St. Thomas's Hospital. Duodecimo; 335 pages. London, J. & A. CHURCHILL. Philadelphia: P. BLAKISTON'S SONS & Co. 1910.

The book is divided into ten chapters, the first eight of which comprise the examination of the various cavities and organs of the body; the last two chapters deal with the Examination of the Newly Born, Embalming and the Restitution and Toilet of the Body. In addition to the description of the technic of conducting autopsies, the author appends to each chapter a short description of the main gross lesions of the organs in question. The author's exposition is clear, systematic and condensed. The illustrations, while line drawings, serve their purpose admirably. A careful perusal of the work has revealed no errors or important omissions. We recommend the book cordially.

The Health of the City. By HOLLIS GODFREY. Duodecimo; 372 + xvi pages. Boston and New York: HOUGHTON MIFFLIN COMPANY, 1910. $1.25.

A book dealing in non-technical language with the health problems of city life has been needed for the proper instruction of interested citizens. This volume treats in a most readable style of the relations borne to civic health of such questions as are at present attracting the attention of health officers all over the world. There is fair discussion, though limited, of the problems arising from air, milk, ice, the city's food, city water and city waste, sewer gas and plumbing, noise and housing. Among the especially commendable features of the book is the selected bibliography filling fourteen pages. The educational value of the book is not to be under-estimated and it should be of great service in arousing a public spirit among those who are interested in the health of a city.

A Fleshless Diet. Vegetarianism as a Rational Remedy. By J. L. BUTTNER. Duodecimo; 372 pages. New York: FREDERICK A. STOKES COMPANY.

The purpose of the writer is to establish the claims of vegetarianism as a rational dietary. There is also an endeavor to demonstrate its value as a curative agent in various diseases and conditions from appendicitis to fecundity. Dr. Buttner has made every effort to give an unprejudiced exposition of the subject, drawing his statements for the most part from authorities whose reliability cannot be called into question. He has failed to give as much discussion to the arguments against vegetarianism as they deserve. *De gustibus non disputandum est* and the question of habit and palate is recognized, but the appetite for meat is regarded by the author as an acquired taste, the prevention of which is possible and desirable through early education. The book is logically arranged, carefully compiled, and written in a popular, readable style.

Books Received

Un Nouveau Traitement du Tabes. Avec quelques considérations sur la répercussion centrale des irritations peripheriques. Par le DOCTEUR HELAN JAWORSKI, de la Faculté de Médecine de Paris, et de Lemberg (Autriche), etc. Duodecimo; 215 pages. Paris: A. MALOINE, 1910. Paper bound; 3 fr., 50.

Progress in Surgery

A Résumé of Recent Literature.

Arsenobenzol for Syphilis. (*Arsenobenzol bei Syphilis.*) B. SPIETHOFF, Jena. *Muenchener Medizinische Wochenschrift,* August 30, 1910.

The author has treated 50 cases with the new remedy. The dosage varied from 0.3 to 0.6. His observations as to the time of healing agrees with that of other observers. Chancres healed in about 3 weeks, roseolae disappeared in from 10 to 20 days, condylomata and moist syphilides were gone within 10 days, mucous patches were cured in 2 to 3 days. In two cases very large indolent glands, which had resisted all other forms of treatment, grew perceptibly smaller within one hour and had almost disappeared in six hours! The Wassermann test was usually still positive 5 to 6 weeks after injection. Spirochetes disappeared from the "irritative serum" 24 to 48 hours after injection.

In a few cases a drug rash was noted soon after the injection. In a case of cerebral lues an epileptic convulsion occurred. Transitory eye symptoms, of no gravity, appeared in a few patients. Tachycardia was likewise noted. No irritation of the kidneys resulted even where previous nephritis existed. Neutrophilic leucocytosis occurs 12 hours after injection and persisted for several days. A few hours after injection a short period of fever, sweating and malaise are the rule. On the second or third day another febrile period regularly occurs. This seems due to the inflammation at the site of injection.

One patient, a woman of 28 years, suffering from syphilis of the throat and marked cachexia, was given 0.6 intramuscularly. Next morning she was found dead in bed. Autopsy showed stenosis of the upper air passages, cicatrized liver gummata, hypoplasia of heart and aorta. Ehrlich believes this death was due to the shock resulting from pain arising from the site of injection. In case of cachexia smaller dosage is indicated, likewise if non luetic organic changes (especially circulatory) are present.

By using Michaelis' technic the amount of fluid injected intramuscularly has been reduced to 9-10 c.c.m. of emulsion.

The Treatment of Syphilis with Ehrlich's Dioxydiamidoarsenobenzol (606). WILHELM WECHSELMANN. *New York Medical Journal,* September 3, 1910.

Visceral lues shows quick recovery, especially syphilis of the testicles and of the brain (epileptoid attacks). Icterus which has existed for a considerable time disappears in ten days. Syphilitic growths of the larynx which had produced such severe dyspnea and stridor that the case was received as one for tracheotomy disappeared quickly and remained only as solid infiltrations, which were treated four weeks later with a second injection; and edema of the larynx, of which we were very much afraid at first, did not occur. Two patients with tumors from cerebral lues stood the injections well, although the symptoms were very severe. The same was the case with two patients who had only lately suffered a luetic apoplexy and a patient with a luetic apoplexy a few weeks old; these three cases plainly showed improvement.

As to the parasyphilitic diseases the author has not observed marked results in cases of progressive paralysis. In tabes a quick improvement has been plainly noticeable. In advanced cases there is little hope for success.

The author has not observed bad after effects of importance, but it has been found that otherwise light infections, such as those with coryza or angina, even if they appear on the ninth day, are accompanied with very high fever, with a temperature from 104° to 105.8° F. Patients with a weak heart should therefore be carefully guarded; besides, in such cases the injection seems not to be without danger. Otherwise, the influence of the remedy appears generally to be of an exciting and invigorating nature. It can therefore be given with benefit to very miserable patients, as, for example, to the tuberculous, in contradistinction to mercury.

Dioxydiamidoarsenobenzol is dissolved by triturating in a mortar from 1 to 2 c.c. of a soda solution, when, by adding acetic acid in drops, a fine yellow paste is precipitated. This precipitate is then made sterile and dissolved in from 1 to 2 c.c. of distilled water, and neutralized by the addition of 0.1 normal soda solution or 1 per cent. acetic acid, according to a very carefully ascertained reaction with litmus paper. The absence of pain depends upon the exactness of this neutralization. The deposit is centrifugalized and the paste which has been deposited at the bottom of the glass is shaken up with a physiological sodium chloride solution. This mixture is drawn into the syringe and slowly injected subcutaneously below the shoulder blade in a place which has been made aseptic and treated with tincture of iodine. The injection does not produce a sensation of pain, but a few hours later there will occur a nervous pain of varying but not excessive degree. On the third or fourth day there will appear a reactive swelling of a varying degree, sometimes with reddening.

Unexpected Results in an Hereditarily Syphilitic Nursling After Treatment of the Mother with "606." (*Unerwartete Resultate bei einem hereditär-syphilitischem Saügling nach Behandlung der Mutter mit "606."*) R. DUHOT, Brussels. *Müenchener Medizinsche Wochenschrift,* August 30, 1910.

The mother, aged 22, was treated for 1½ years by means of mercury for an extremely virulent syphilis. During this period almost her entire face was destroyed by serpigonous ulcerations. She gave birth to a live child which showed all typical signs of heredity lues—appearance of age, deep red color, wrinkled skin, papules, weak cry, snuffles. The first three weeks after birth the child gained only 100 gms. in weight.

As the facial ulcers of the mother were increasing, she received 0.5 and 0.45 of "606" on succeeding days. Two days later the ulcers looked clean, and twelve days after injection they had healed. But more surprising was the fact that on the third day the child's color became normal, the papules disappeared, its catarrh was cured and it nursed well. In the next three weeks the infant gained 1200 gms. No arsenic was found in the milk.

Ehrlich believes that specific antitoxines are taken in through the milk. He advises against injection of infants with "606" as the destruction of the myriad spirochetes found in hereditary luetics would kill. Only after their number has been reduced, as in the above case, would injection of 0,008-0,01 per kilo, be permissible.

The Operative Treatment of Sterility in the Male, with the Report of Six Cases. FRANCIS R. HAGNER. Ohio *State Medical Journal,* September 15, 1910.

Based upon the finding that in gonorrheal epididymitis the globus minor is most involved and the single efferent duct is thus occluded, the rationale of an anastomosis of the vas deferens and globus major attracted attention. Hagner reports six cases of sterility treated along the lines first suggested by Martin, with four cures. His modus operandi consists in removing a small elliptical piece from the globus major to correspond with an incision in the vas deferens. Four sutures serve to complete the operation. It is important to ascertain that there is no occlusion of the vas deferens above the point of anastomosis. This may be determined by slitting the vas and injecting colored fluid into it. If the vas be patulous the fluid will promptly appear in the posterior urethra.

Chronic Prostatitis with Special Reference to Treatment. W. C. BRYANT, Pittsburg. *The American Journal of Urology,* September, 1910.

The disease is even more common than is generally believed. For example, at least seventy-five per cent. of all gonorrheas are followed by prostatitis. There are, indeed, two great causes of chronic prostatitis—gonorrhea and congestion, the latter depending upon excessive intercourse, masturbation, etc. The pathological picture con-

sists of occlusion of the excretory ducts, retention, cysts and abscesses, and, subsequently, fibrous tissue formation.

Symptoms of this affection may be classified into three groups—urinary, sexual and referred. Of the urinary symptoms, common ones are hesitation in starting the stream, lack of force, and dribbling after urination. The engorged and hyperplastic gland may even lead to obstructive symptoms. The sexual symptoms are loss of desire, imperfect erections, premature ejaculations, etc. No satisfactory explanation has been offered as to why prostatitis should result in these manifestations. The referred symptoms are numerous. The most common is pain in the lumbar region. Other painful areas are in the perineum, testicles, glands, the kidney regions, along the course of one or both sciatic nerves, etc. The most important objective symptoms of chronic prostatitis is the character of the expressed discharge.

The general treatment of this disease is important, because the patients are frequently in poor physical condition or neurasthenic. Urinary antiseptics are only of limited value. Any other local pathological process—chronic urethritis, stricture, chronic vesiculitis, chronic congestion or hyperplasia of the verumontanum—must be treated either before or during the treatment of the prostate. Although some objections have been raised to massage of the prostate, it is still to be considered the most important method of treatment of chronic prostatitis. The manipulations should begin in the middle of the gland and all areas should be carefully covered from this point. At the end of the treatment the finger should be rolled from the periphy toward the center. The intervals between treatments should not be less than three days. After every massage a copious urethro-vesical irrigation is imperative. Silver nitrate in a 1:10,000 dilution is as good as any. Failure to irrigate after massage may be responsible for the production of urethritis or cystitis.

Inflammatory Strictures of the Prostatic Urethra. (*Les Rétrécissements Inflammatoires de e'Urètre Prostatique.*) GIROLAMO, Naples *Annales des Maladus des Organes Genito-Urinaires,* September 1, 1910.

Because so little reference is made to the existence of gonorrheal strictures of the prostatic urethra, the author had always been under the impression that the condition was rare. By a series of careful and prolonged examinations, however, he found that stricture of this portion of the urethra is not very unusual. Strictures of the anterior and of the prostatic urethra are of the same histological appearance and develop under identical circumstances. A stenosis of the prostatic urethra is always associated with one or more strictures of the anterior canal. Girolamo found, that in individuals suffering from strictures in both regions, the anterior strictures were of longer standing. The prostatic urethra can be explored only after the strictures in front of it have been dilated.

Exploration of the prostatic urethra is best made by means of bougies with metallic olivary tips. In the author's hands electrolysis has given the best results in the treatment of strictures of the prostatic urethra: the slight distensibility of this portion of the canal precludes good results from dilatation by means of sounds. The author claims positive and constant results by his method of "circular electrolysis."

Excision of Gastric Ulcers. E. DEANESLY, Wolverhampton, *British Medical Journal,* October 1, 1910.

Deanesly has followed up the subsequent histories of the patients upon whom he had performed gastro-enterostomy for gastric ulcer, and found that in about one-third the symptoms of gastric ulcer recurred. Recurrent pain is the most frequent symptom of relapse. In other hands, hemorrhage and even perforation have been reported. All these facts seem to show that the operation of gastro-enterostomy for gastric ulcer is not always curative. The author holds that excision of the ulcer is the best operation; he claims that this operation is as feasible as gastro-enterostomy and is not attended by greater operative risk. He has done the operation in eight cases without a fatality. He also recommends excision for perforation of a gastric ulcer. All five patients upon whom he performed this operation recovered.

The Interrelationship of Gall Stone Disease and Appendicitis. FRANK W. FOXWORTHY. *The Journal of the Indiana State Medical Association,* August 15, 1910.

After reporting a case of gall stone disease with appendicitis, the writer reviews the symptoms of the two diseases which are of value in establishing the differential diagnosis. He has compiled the opinions of many of the prominent surgeons upon the following six points: 1. Do you find that appendicitis and gall stones are interrelated? 2. If so, what per cent. of gall stone cases have an inflamed appendix or *vice versa?* 3. Have you any special diagnostic symptoms for gall stone disease? Have you any special symptoms for appendicitis? 5. Would any new symptoms be present if a patient is suffering from both gall stone disease and appendicitis? 6. Would any of the usual symptoms of gall stone disease be modified or wanting by a concurrent appendicitis or *vice versa?* From answers to the foregoing questions, Foxworthy comes to the conclusion that the surgical profession is about equally divided upon the question of the interrelation of gall stone disease and appendicitis, though he believes that the interrelation exists.

Verminous Appendicitis. H. A. LEDIARD. *Lancet,* September 17, 1910.

Lediard reports two cases of appendicitis in whom the oxyuris was found in the appendix. In the first case, a child, the live oxyuria were found; in the second case, an adult, the worms were imbedded within a concretion. Appendicitis resulting from oxyuris within the appendix has been reported frequently, notably by Guinard, Kelly and Ashoff. They give rise to inflammation by burrowing into the mucosa.

A New Treatment for Abdominal Surgical Shock. JOHN R. HOPKINS. *Colorado Medicine,* September, 1910.

Take out two skin sutures as near the umbilicus as the wound will permit, then pry apart the continuous sutures in the fascia and peritoneum. One can now see if hemorrhage is present. This procedure is not difficult nor very painful; because when patients are in shock they are more or less insensible to the causes of ordinary pain. See that a nurse has ready very hot and cold normal salt solution, reservoir with four feet of rubber tubing, together with a glass tube or canula six to eight inches long. Both rubber and glass tubes should have a diameter of one-third to one-half inch. Have a quart of saline solution at temperature 112° F. in the reservoir, which should hang three feet higher than the abdomen. Now have the wound held open so that you can see omentum or intestines, also see that the tube and the canula are now full of the hot solution, then insert the long canula beneath the omentum, if possible, pushing it upward so that the glass tube penetrates to the posterior peritoneum up behind the transverse mesocolon to the neighborhood of the posterior wall of the stomach, getting as near to the solar plexus as possible. The solution, still at 112° Fahr., is now allowed to run in as rapidly as it will. Probably a pint will fill the abdomen and be enough. This will take only five or six seconds. Now during the first two or three seconds of this time the patient feels little or no pain; he only feels that the hot solution is permeating among the intestines; but the remaining two or three seconds are different—the pain is very severe, for then the splanchnic nerves, the solar and hypogastric plexuses are being strongly irritated by the heat and pressure of the hot salt solution. They are well known to be very sensitive. As the patient is not under an anesthetic the reflexes are not depressed by it. Now the irritation of the splanchnic nerves and sympathetic ganglia produced by the heat and pressure at once cause contraction of the intestinal arteries, veins and portal vein and thus a marked rise in blood pressure. A reaction is produced by the sudden pressure of this hot solution on this great and important part of the vasomotor nerve mechanism, and is a sudden reversal of the phenomena of surgical shock. The radial pulse returns or its pressure is markedly increased. The glass tube is

taken out quickly; a small piece of gauze is laid over the wound and a strip of adhesive plaster applied, then a tight abdominal binder to sustain the pressure.

If this treatment should not succeed, it should be repeated in one or two hours. In addition to the above treatment hot salt solution per rectum, ten ounces every two hours, principally on account of getting the heat near the hypogastric plexus and splanchnic nerves should be given; also full glasses of hot water to drink for similar purposes; otherwise do not disturb the patient with hypodermics or by even raising the foot of the bed—just keep him warm and as comfortable as possible.

The Indications for and a New Technic Pertaining to the Operations of Cecostomy and Appendicostomy in the Treatment of Intestinal Lesions. SAMUEL GANT, *Interstate Medical Journal*, September, 1910.

After tabulating the advantages of cecostomy and the disadvantages of appendicostomy, Gant describes his form of cecostomy with an arrangement for irrigating both the small intestine and the colon. He advocates this operation in the treatment of enteritis, intestinal parasites, paralytic ileus, intussusception, all types of colitis, and various other conditions.

Insufflation Narcosis (Meltzer) in the Human Being. (*Insufflationsnarkose (Meltzer) beim Menschen.* E. UNGER, Berlin. *Berliner Klinische Wochenschrift*, September 19, 1910.

Unger reports two cases. In the first patient, the operation was undertaken for a large sarcoma beneath the clavicle. Under ether narcosis the catheter was easily introduced into the glottis. The anesthesia of laughing gas and ether was continued through the catheter. The operation lasted about an hour and only 100 gr. of ether were required. The patient's condition remained good throughout the operation and a necessary incision of the pleura was borne without the slightest disturbance. The patient reacted promptly from the operation.

The second insufflation anesthesia was given for an operation upon tuberculous glands of the neck. Owing to a twist of the epiglottis and swelling and congestion of the opening of the larynx the tube was inserted with difficulty. After insertion of the tube, however, the anesthesia proceeded uneventfully. When the tube was removed at the end of the operation, the patient became cyanotic, the respiration was labored and entirely abdominal, and a rapidly spreading subcutaneous emphysema developed. These symptoms lasted for half an hour, when they subsided. Unger is unable to account for these untoward symptoms. Despite the alarming manifestations in the second case, the author believes this method of narcosis is highly promising.

Experimental Results in the Treatment of Strychnine Poisoning with the Aid of Intratracheal Insufflation. (*Experimentelle Erfahrungen über die Behandlung von Strychninvergiftung mit Hilfe der intratrachealen Insufflation.* A. O. SHAKLEE and S. J. MELTZER, New York. *Berliner Klinische Wochenschrift*, September 26, 1910.

With the aid of intratracheal insufflation and the intravenous injection of curarin, Shaklee and Meltzer were able to save a majority of dogs in whom a toxic dose of strychnine had been injected. In addition to these measures, the animals were given an intravenous infusion of salt solution in order that the strychnine should be eliminated more rapidly by the kidneys. The insufflation must be continued for a long period, ranging between three and seven and a half hours.

The Treatment of the Aspiration of Air. (*Zur Behandlung der Luftaspiration.*) P. CLAIRMONT, Vienna. *Archiv. für Klinische Chirurgie*, Vol. 92, Part 4.

The symptoms of aspiration of air into the venous system are usually well defined. Even in those cases in which the peculiar noise of air being sucked into a vein is absent—as when air is aspirated into the cerebral sinuses—the subsequent symptoms are characteristic. They consist in suddenly slowed and deepened respiration, arhythmic and fluttering pulse, sudden collapse of the patient under narcosis, and subsequently, cessation of respiration while the heart continues to pulsate for a time.

On an experimental basis, Clairmont believes that, in these rapidly fatal cases, the heart should be exposed and the air aspirated out of the right auricle and ventricle. The diagnosis is readily made, and the treatment should be promptly begun in order to be effectual. The heart is exposed as in the Trendelenburg operation for extraction of an embolus from the pulmonary artery and the air is aspirated from its right half by means of a specially devised suction apparatus. This procedure is to be supplemented by salt solution in fusion into the right ventricle, or by direct blood transfusion, as well as by cardiac massage and artificial respiration.

Tibiale Externum and Fracture of the Sesamoid. Report of Cases. C. F. PANITER, Boston. *Boston Medical and Surgical Journal*, September 1, 1910.

While running rapidly up a flight of stairs, the patient experienced a sudden pain on the inner side of the foot. The region over the scaphoid bone was swollen and very tender. Despite rest, bandages, etc., the pain persisted, especially on walking, and three months later the patient presented himself for examination. The swelling and the tenderness over the scaphoid bone persisted, and *X*-ray examination revealed a shadow of a chip of bone. At operation, a smooth piece of bone about the size of a lima bean was found, which seemed to articulate with the scaphoid by means of a false joint. The tendon of the posterior tibial muscle was intimately involved with this bone, and careful dissection was necessary in order to remove the bone. The patient was relieved of all symptoms. Paniter quotes Dwight to the effect that this bone, which the latter calls the tibiale externum, occurs in about 10 per cent. of individuals. The author reports another case of fracture of both sesamoid bones of the great toe following an injury, the result of a walk over a rocky shore. Protection of the foot from pressure, at first in a plaster cast and then by a felt and leather support to keep the ball of the toe from resting upon the floor, afforded relief.

Juxtaepiphyseal Osteomyelitis of the Tibia Observed During the Course of Measles. (*Ostéomyélite Juxta-Épiphysaire du Tibia Observée au Cours de la Rougeole.*) TEISSIER, VEAU, and RICHET, JR. Annales *de Médicine et Chirurgie Infantiles.* September 1, 1910.

The case was one of a child of seven, who developed a swelling and pain in the right knee during the incubation period of an attack of measles. Under observation a similar but less marked condition of the left knee was noted. Symptoms in the right knee joint rapidly progressed and an exploratory puncture was performed. It yielded pus containing the staphylococcus The osseous origin of this purulent arthritis seemed evident enough, yet the arthrotomy performed resulted in a prompt reduction of the local and general manifestation. Several days later, however, the symptoms recurred, pointing to the upper end of the tibia. At the second operation, the bone was found extensively diseased and a subtotal resection of the upper end of the tibia was performed. Convalescence was uneventful, and the functional result, good.

Modern Treatment of Diaphyseal Fractures of the Lower Extremities. (*Moderne Behandlung der Diaphysenfracturen der Unteren Extremitäten.*) WILMS, BASEL. *Medizinische Klinik*, September 4, 1910.

The progress that has recently been made in the treatment of these fractures has been in three directions: 1. Steinmann's method of nail extension; 2. Zuppinger's method of splinting; 3. A series of operative procedures.

In fractures of the shaft of the femur, treatment by plaster of paris should be relegated to the past except in the case of unruly or very young children. Extension treatment is the method of choice. The older methods of extension on strips of adhesive plaster has been modified by additional lateral extension, varying according to the displacement (Bardenheuer). But extension applied according to Zuppinger—traction of the limb, with the

knee joint fixed in semiflexion—is at least as effectual, and has many advantages. Less weight is necessary, there is a more even balance between the flexor and extensor muscles, and a certain amount of motion at the knee. The Zuppinger splint may be combined with lateral traction. In the rare cases in which this method of extension has failed (determined in the first two weeks of treatment), the method of nail extension is applicable. This consists in traction applied to nails driven into the lower fragment of the femur. Occasionally open operation for fracture of the femur will have to be performed.

In the cases of fracture of the lower leg the ordinary plaster of paris dressing will not infrequently suffice. Where there is marked displacement the principles as obtained above are to be followed. Open operation will be more frequently required than in cases of fracture of the femur.

Vaccine Therapy: Its Administration, Value and Limitations. SIR A. E. WRIGHT, London. *Lancet,* September 17, 1910.

In his address, Wright reiterates many of his views concerning the administration and value of vaccine. He holds that the vaccines should be administered by a bacteriologist trained in opsonic work and not by the clinician. He still regards the opsonic index as the only rational guide in the administration of vaccine and answers the criticism of those who regard the index as unstable by the statement that the error in computing an index is a "functional" and not a "working" one. Wright broadens the field of opsonic therapy to surprising limits. In addition to the undoubted infections, he now includes such diseases as *X*-ray dermatitis, inflammatory troubles at the roots of teeth and toothache, pruritus ani, hay fever, urinary calculus, indigestion, vomiting, flatulent distension of the stomach, epilepsy, cancer, diabetes and enuria, in all of which, he believes, infection with microbes plays a part.

A Case of Recurrent Abscess Formation, Due to Streptococcus Infection, Successfully Treated by Autogenous Vaccines. GEORGE G. ROSS. *Monthly Cyclopedia and Medical Bulletin,* September, 1910.

The case reported was one of staphylococcus bacteremia, and not streptococcus as indicated in the title, with furunculosis, subperiosteal abscess of the head, and necrosis of the bones of the skull, treated by operation and autogenous vaccine. From the pus of the parietal abscess staphylococcus aureus was recovered and likewise from the blood. An autogenous vaccine was made and four doses were given at intervals of four days. The first dose was 50,000,000, the second 100,000,000, and the last two 150,000,000. With no constitutional reaction, the local condition rapidly improved. The general condition of the patient improved, but a portion of the bone at the base of the abscess was denuded and necrosed. At a later date this sequestrum was removed and the patient was given three more injections of the autogenous vaccine at four days' interval, each dose being 150,000,000. Within three weeks the patient was in normal condition.

The writer lays stress upon the better results that are to be obtained from using the autogenous vaccine. He believes that the best results are obtainable where leucocytosis and pus formation exists. Attention is drawn to the general improvement that frequently follows the vaccine treatment, and this Ross attributes to the stimulating effect of the treatment upon general metabolism.

Operation for Cystocele: An Improved Method. D. TOD GILLIAM. *Interstate Medical Journal,* September, 1910.

The operation presented consists of three steps: 1. An oval denudation of the most prominent part of the cystocele as in the old time operation. 2. Dissecting flaps from the vaginal wall on either side of the denuded area with which to cover the latter. 3. Bringing the flaps together over the denuded area and suturing them to it and to each other. He believes that the site of the cystocele is strengthened by an additional layer of fascia—that taken from the sides of the vaginal wall.

The Treatment of Rectal Fistula. J. RAWSON PENNINGTON. *Illinois Medical Journal,* September, 1910.

Three modes of procedure are considered: Simple incision, the injection of bismuth paste, and excision or incision with immediate suture. Pennington regards proctorrhaphy or the paste or a combination of the two as the nearest approach to the ideal method of treating extensive and complicated cases of rectal fistula. He accounts for the varied results that have been reported from the use of the bismuth paste as due to differences in the hydrolysis of subnitrate of bismuth of different manufacturers.

Stovaine: Its Use in the Treatment of Shock, etc., in Injuries of the Lower Extremities. GEORGE THOM, Cairo. *Lancet,* October 1, 1910.

In severe traumata of the lower extremities Thom has observed that the injection of stovaine into the spinal canal almost immediately relieves the shock. The pain and restlessness disappear; the pulse improves, the color returns and the patient's distress diminishes. While under the effects of the anesthetic, whatever operation is necessary is performed, and the post-operative shock is greatly diminished. The author also recommends the intraspinal injection of stovaine for the purpose of "putting up" fractures of the lower extremity.

Eighteen Cases of Spinal Anesthesia by the Stovaine-Strychnine Method of Jonnesco. L. MCGAVIN, London. *British Medical Journal,* September 17, 1910.

McGavin reports in detail the course of the anesthesia in eighteen cases. On the whole, he regards the results as disappointing. Four of the six high injections were successful, as far as the analgesia above the phrenics is concerned. The unsuccessful cases of high puncture show it to be fraught with danger, and from the humane standpoint, unjustifiable. The cases of low puncture proved nothing except that the period of analgesia was shortened as compared to the use of stovaine alone. The effects of the analgesia on the cranial nerves appears to be irregular; some are affected while others are not. On the basis of his experience, McGavin has decided to abandon the method.

The Treatment of Aneurism of the Aorta by the Introduction of Wire and the Passage of a Galvanic Current. A. A. ESHNER, Philadelphia. *American Journal of the Medical Sciences,* October, 1910.

Eshner reviews all the reported cases in which this method of therapy was used and reports two cases of his own, in which the treatment apparently proved of benefit. The technic of the operation is simple. A hollow needle is thrust into the most prominent portion of the aneurismal sac, through which enough gold or silver wire is introduced in order to fill the sac. Ordinarily ten to twelve feet of wire are sufficient. The end of the wire is connected with the positive pole of the battery and a current, gradually increased to 60, 80 or 100 milliampéres, is applied and as gradually decreased. The current is allowed to pass for an hour or an hour and a half. The negative pole is applied to an indifferent part of the body. A spurt of blood usually follows the introduction of the needle, but soon ceases. The operation is remarkably free from accident and the benefit derived is usually prompt. Only sacculated aneurisms are suitable for operation.

The Technic of Amputation in Cases of Diabetic Gangrene and Phlegmon. (*Zur Technik der Amputation bei Gangrän und Phlegmon (Diabetes).* W. KAUSCH, Berlin. *Münchener Medizinische Wochenschrift,* August 23, 1910.

When gangrene and phlegmon are present in diabetics, flap amputations anywhere near the line of demarcation are nearly sure to fail. When the limb is invaded high up the surgeon is confronted by almost insurmountable difficulties. Kausch has found that if a circular amputation at one level is resorted to, healing takes place, probably because the wound surface is simple and readily drained. After it is found that the morbid process has been cut short, the exposed bone is covered by applying extension to the skin by means of the usual method. A weight of 2-4.5 kilos is required. Gradually the soft parts are pulled down like a cuff, and a serviceable stump obtained without reamputation. Case reports are included in the paper.